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The Oldest American Aeronautical Magazine

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SPECIAL FEATURES

GERMAN NIGHT AIR TRANSPORTATION
PARIS HOLDS TENTH AERO EXPOSITION
HIGHLIGHTS OF THE PARIS SHOW

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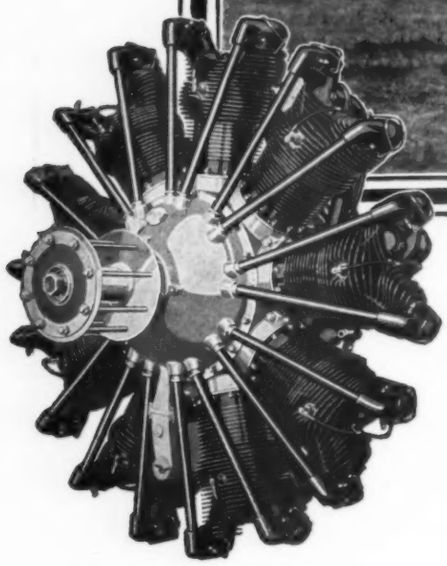

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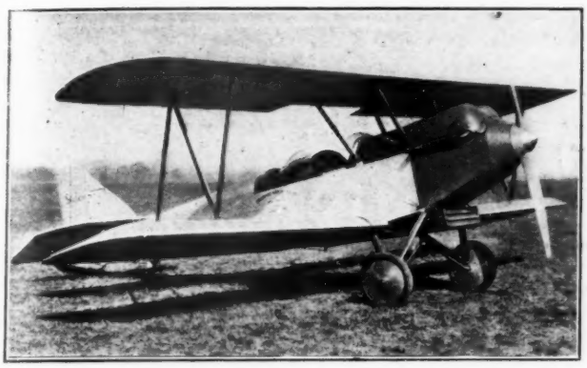

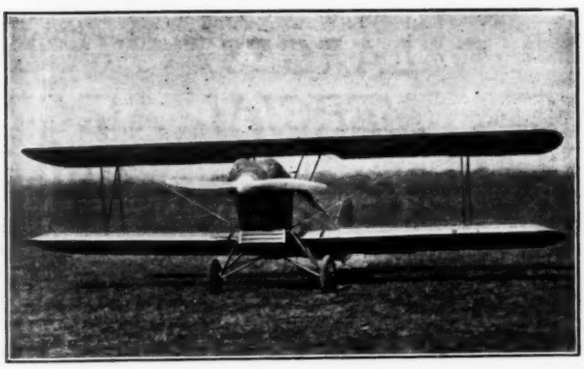

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With the Editor

Aeronautics has always been a subject with a broad international aspect and aeronautical engineers, airplane designers, and, in fact, everybody connected with aviation in this country, have a very decided ininterest in the progress made in aeronautical engineering abroad. France has from the earliest been among the leaders in aeronautical thought and the Paris Show, therefore, immediately becomes of international interest. The Show itself is, in fact, international although, in its 1926 version, it was decidedly national in character, for comparatively few airplanes or engines of other than French manufacture were exhibited. However, it was very characteristic of French aviation progress during the past two years, that is, since the last Aviation Salon, as it is termed, was held.

So numerous was the representation in the Show, that it has been found impossible to discuss all aspects in one issue of AVIATION. Engines figured very extensively among the exhibits and while the aircraft are fully dealt with this week, the many highly interesting engines exhibited will, next week, be described and discussed in detail.

In 1926
WRIGHT WHIRLWIND ENGINES
Flew More Than
1,750,000 MILES
In Commercial and Private Airplanes

Whirlwinds Have In 1926;

In Competition

Made first North Pole flight by Commander Richard Byrd in Fokker 3-engined plane.

Won 1st place Annual Reliability Tour of 2,535 miles in TravelAir plane carrying 600 lbs. pay load, average speed 124½ m.p.h.

Won 2nd Place Annual Reliability Tour in Buhl Verville Airster carrying 800 lbs. pay load, average speed 113.5 m.p.h.

Won 3rd Place Annual Reliability Tour in Stinson "Detroiter" carrying 640 lbs. pay load, average speed 106.7 m.p.h.

Won Transport Race for Detroit News Air Transport Trophy at Philadelphia in Wright Bellanca carrying 1,607 lbs. ballast at 121.53 m.p.h.

Won Light Commercial Race at Philadelphia carrying 1,145 lbs. ballast at 121.36 m.p.h.

Won 12 out of 18 prizes they competed for at Philadelphia.

Won 3 First Prizes at Denver Mile High Air Meet in Ryan M-1.

Made Non-stop Portland, Oregon to Los Angeles flight 1,050 miles 9 hrs. 20 min. in Ryan M-1 Monoplane of Pacific Air Transport.

Carried 2,666 lbs. pay load at Philadelphia at 114.99 m.p.h. in the Stout 3-engined airliner built by the Ford Motor Company.

In Daily Service Flown for

Philadelphia Rapid Transit Company—339,950 engine miles with $75.55 cost of engine parts averaging 10½ gal. fuel per engine hour on their 255 mile route—Philadelphia, Washington, Norfolk, using 12 WHIRLWINDS exclusively in Fokker planes.

Varney Air Mail Service—172,080 miles with $78 cost of engine parts on their 520 mile route across the Rocky Mountains from Salt Lake to State of Washington using 7 WHIRLWINDS exclusively in Swallows.

Colonial Air Transport—89,000 miles with $225 cost of engine parts on their 192 mile route New York to Boston, using 4 WHIRLWINDS exclusively on this route in Fokker and Curtiss planes and 3 in their Fokker Airliner.

Pacific Air Transport—251,700 miles on their 1,121 mile route Los Angeles to Seattle using 8 WHIRLWINDS exclusively in Ryan and Travel Air planes.

Northwest Airways since October—39,600 miles on their route 377 miles Chicago to St. Paul using WHIRLWINDS exclusively in Stinson "Detroiters."

National Air Transport—30,980 engine miles as part equipment for their 987 mile route Chicago to Dallas in Travel Air, Ford—3-engine plane and Wright Bellanca.

Florida Airways—74,690 miles, as part equipment, on their 683 mile route Atlanta to Miami using 4 WHIRLWINDS in Stinson and Curtiss planes. Carried $2,000,000 currency into Miami from Atlanta the day after the hurricane, in Stinson "Detroiter".

Canadian Air Express 40,590 miles on their route at Red Lake, Canada, using 3 WHIRLWINDS exclusively in Stinson "Detroiters" and Curtiss Larks.

Huff-Daland Dusters, Detroit Arctic Expedition, Charles Dickinson, Henry Dupont of Wilmington and Pontiac, Canadian and American Fairchild Company, Bennett & Rodebaugh of Alaska, Central Canada Airlines, Frederick Ames of Boston and many others.

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AVIATION

The Oldest American Aeronautical Magazine

VOL. XXII JANUARY 10, 1927 No. 2

The Paris Show

THE TENTH Paris International Aviation Show which closed on Dec. 19, is a two-yearly event and, therefore, it is not a little bit surprising to find that the show marked the very considerable progress which has been made during this period. It is, of course, unfortunate that the exhibition, while characterized as "International" in its title was not more international in scope. There were but four countries represented other than France and of these four, the progressive little state of Czechoslovakia was the only one of which it could be said that it was anything like fully represented. England, Holland, and Belgium rounded out the international scope of the show. And, in view of the meagre representation of these countries, it would hardly seem justifiable to judge the aeronautical progress made in these countries by their respective exhibits at the Paris Show.

Considering, therefore, only the French exhibits, it seems that in pursuit plane design the greatest progress has been made, as far as actual airplanes are concerned. One notable development is the entirely new class of pursuit airplane, known as the "Jockey", of which type one example was exhibited, namely, the Nieuport 48. In this class of plane it would appear that every consideration is subjected to speed and maneuverability. All protective armament is omitted, even the gasoline tank being unprotected, while the number of guns carried is reduced from four to two. The gasoline supply is reduced from a 2 hr. supply to 1½ hr.

There are no details available at this moment on the performance of this single example of the Jockey class and it would be extremely interesting to compare its flying qualities with, for example, those of the Curtiss Hawk or the new Boeing pursuit plane, and then to see whether the improvement in performance, if any, warrants the curtailment made in other directions. Obviously the Jockey type of plane becomes an offensive weapon pure and simple. It is hoped, presumably, that the excessive speed and maneuverability expected from such a type will make the plane offensively as powerful, in spite of reduced armament, as the more standard type of pursuit airplane.

A large number of the French planes exhibited at the Grand Palais were of wooden construction, although many incorporated a considerable proportion of metal construction. Where metal construction was employed it generally involved riveting rather than welding. A notable example of the type of riveted metal construction employed is to be found in the Avimeta AVM 88 pursuit plane which is constructed of Alferium light alloy.

In the larger class of military aircraft, day and night bombers and observation airplanes were much in evidence. And, in the majority of cases, it appears that the French transport planes for commercial aviation are either converted day or night bombers both of the single and multi-engine type, or, at least, designs in which the influence of military requirements is very apparent. For example, the Breguet 26, a six-passenger cabin airliner, is, in reality, a modification of the well-known Breguet XIX observation and bombing plane. It is true, of course, that Farman has specialized considerably in commercial transport aircraft but it was noticeable at the Show, that there was a striking likeness between many of the Farman airliners and the Farman military types.

Giant Aircraft

IN THINKING of military or commercial aviation it has become habitual to think that an airplane is expensive if it costs over $50,000. Such a figure is the limit to which our minds run, and when it is suggested that half-a-million be spent on building a plane we immediately register a reaction that such a project is extravagant. Perhaps, however, it would be a good thing if we were to think in similar terms with the production of giant airplanes or flying boats.

German engineers have done a considerable amount of work on the project of building an enormous flying boat for trans-Atlantic service. The wing of such a plane is to serve as the cabin and engine housing and the weight is to be distributed throughout the span. In normal planes, the weight is concentrated towards the middle of the structure and, as a result, the wings become heavier per unit with increasing size. By distributing the weight throughout the span the principal is changed from that of a cantilever bridge to that of a bridge built on piers, a type which can be extended in length indefinitely. With good engineering the strength of the structure could accurately be figured, the only assumption being the variation of air currents on the opposite ends of the wing. The problem of lateral control would be a very serious one but not insurmountable.

The question, however, has often been raised as to the real value from a commercial standpoint of giant airplanes. Many complain that the structure weight with size goes up beyond control but under the new principle of construction already referred to this will not necessarily be the case. Furthermore, it should be remembered that from the operating standpoint it will always be cheaper to carry, for example, one hundred passengers in a single airplane than to employ two machines of smaller size, each carrying one half the load. If this is the case, there would seem every indication of great possibilities in the really large airplane for use over the main trunk airlines of the world in the future.

German Night Air Transportation

Berlin-Koenigsberg Night Airway Fully Lighted. Three-Engine Planes Used.

By ERHARDT MILCH
Director of the German Luft Hansa

CLEARLY recognizing that flying at night is one of the main requirements of the future of air transport, the officials of the German Luft Hansa air services have been particularly interested in the development of night flying. In 1924 and 1925, extensive trials were carried out on a number of night routes by the German air transport companies operating at that time. These trials had shown up such excellent results that the new German air transport combine, the Luft Hansa, in the beginning of 1926, started night flying service for passengers. On May 1, the night route Berlin-Danzig-Koenigsberg (over 400 miles) was opened up and carried on regularly until the beginning of the winter service, on Nov. 15. The record attained in these night routes for passenger service during the Summer was splendid. A reliability and punctuality of nearly 100 per cent was achieved. Besides a large number of passengers, a considerable amount of mail, newspapers and freight were carried on this line. For the first time in Europe everybody could make use of the airplane for traveling at night. All the passengers were thrilled by the wonderful aspect of the illuminated cities at night. They were all enchanted by the advance of human ability. Based on these good results, the system of night routes will be further extended next year. The new lines will, as in the case of the route B.-D.-K., be equipped with complete night flying illumination.

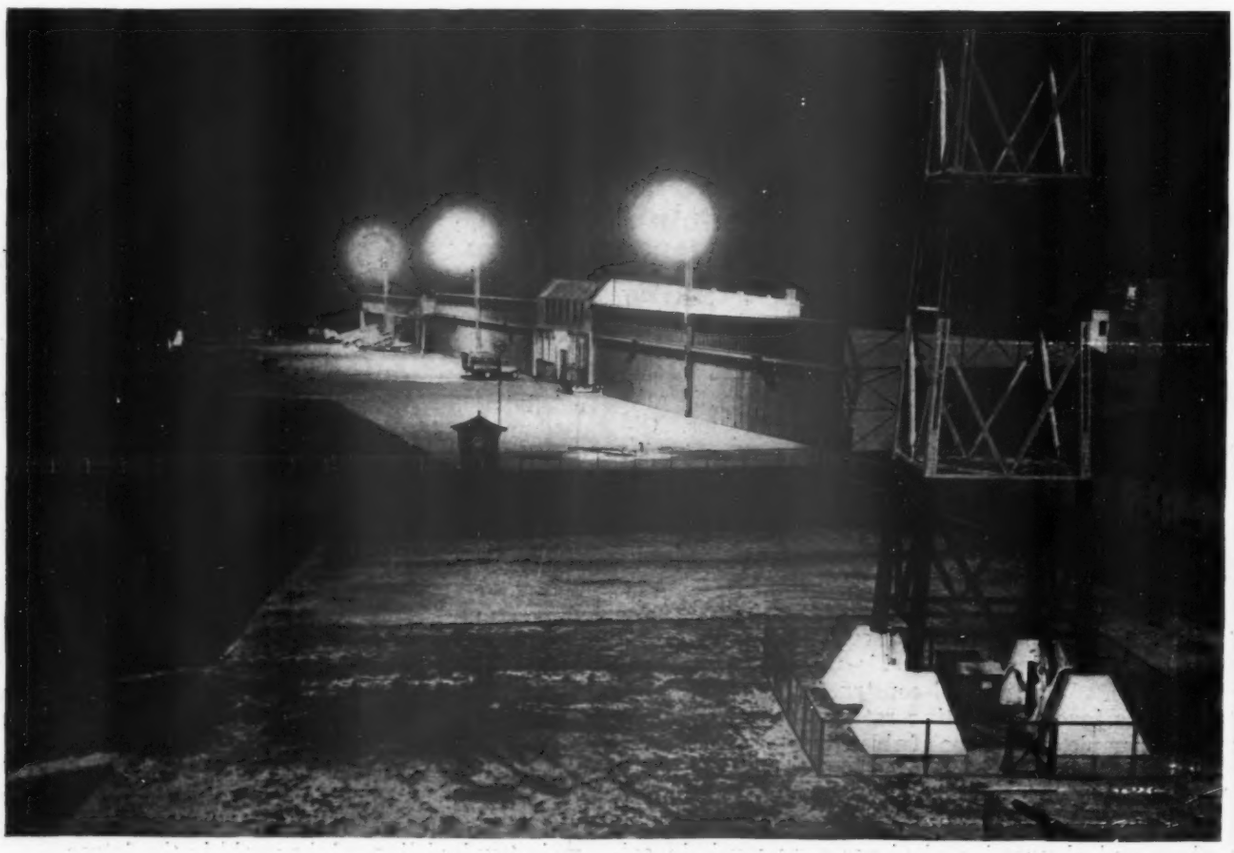
The night route has been operated with the three-engined Junkers G.24 monoplanes which, for this purpose, were equipped with all modern means of navigation. Besides the compass, every plane was supplied with a Gyrorector and a bank and turn indicator, making it possible to keep the machines in straight flight and to steer it with absolute safety, even on the darkest night. For orientation and landing there are powerful searchlights attached to the wings, receiving their current from a small generator mounted underneath the fuselage. In addition, there are three magnesium flares fastened to the underside of each wing, capable of illuminating the landscape within a radius of 1,000-1,500 ft. to a brightness equal to daylight, in case of a landing becoming necessary at an emergency field.

Night Flying Instruments

Local fogs are easily avoided by means of a complete wireless telephone system, S. & E. sets, enabling the pilot to receive weather reports and inquire about his position at all times during the flight. The interior illumination of the cockpit is only so bright as not to cause any blinding of the pilot while the passengers' cabin is perfectly illuminated by numerous electric lamps and domelights. A soft violet-blue glow makes all the instruments on the dash visible for easy recognition and reading.

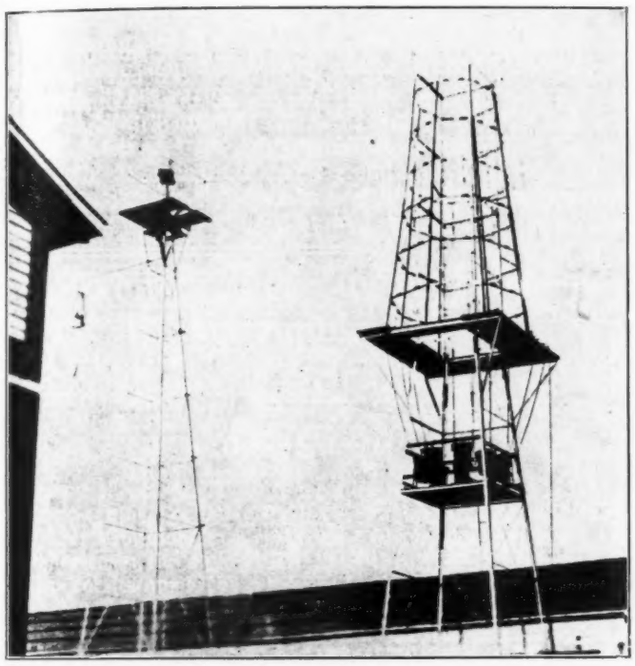
The night illumination of the route admits a perfect orientation along the line. About every 20 miles there are revolving beacons, similar to those used in water navigation. In order to obtain the greatest range possible, these beacons are supplied with silvered parabolic glass reflectors, and in most cases they are hooked up to the high-tension power lines.

Between these revolving beacons, at intervals of three or four miles, are placed Neon tubes, giving off an orange col-



Tempelhofer Airport, Berlin, at night

ored light, thus securely leading the plane from beacon to beacon, even under the worst conditions of visibility. At each of the beacons there is established an emergency landing field. The Neon tubes mentioned above burn day and night. In addition to these two forms of electric beacons there are, in some locations, where no electric current is available, flashing acetylene beacons.



The experimental Neon beacon installed at the N.A.T. air mail field at Moline, Ill. The Neon beacon is the tower on the right and the Neon tubes, which glow a brilliant red when operating, are invisible in the picture because made of glass, but are laid along the vertical members of the tapering conical structure above the upper platform. On the lower platform will be seen the transformers which step up the low tension current from the mains to the high tension electric current necessary to operate the Neon tubes.

For airplanes taking off and landing, the airports are supplied with a large variety of illuminating devices, depending upon the importance of the airport. In the first place, there is erected close to each airport a high beacon, visible from all directions. These beacons generally consist of revolving searchlights which, under average conditions of visibility, can be seen at a distance of from 50 to 75 miles. For locating the field itself, there are, in the immediate vicinity, field identification marks, usually consisting of steady burning Neon tubes.

Tempelhofer Airport, Berlin, has on its two radio towers two flashing Neon lights. The actual boundaries of the field are indicated by a continuous line of red lights placed 150 to 200 ft. apart. The spot where the plane should touch the ground is marked out by a line of green, white and red lamps, changing in order of color with the wind direction and burning from dusk to dawn. Besides showing the wind direction, this line of lamps enables the pilot to judge his speed and height above the ground. The landing is made from green over white to red. Thus the red light is to windward and the wind blows in the direction, red, white, green. All obstructions near or on the field are either marked by red warning lights or brightly illuminated by searchlights.

Terminal Lighting

The Tempelhofer Airport is especially lighted by means of seven "suns" erected on high surrounding points. The "sun" consists of five electric bulbs, each of 1000 watts. They spread a very agreeable light over the whole field which is alone sufficient for making a safe landing. In addition these lights illuminate the buildings on the airport in a way that they are easily recognized from the air. By means of these "suns" the space in front of the hangars is made as light as day for servicing the machines. Directed only downwards, they have no blinding effect. The Tempelhofer Airport is also equipped with an illuminated wind direction indicator that shows up very well from the air.

Either of these devices—the "suns" or the line of green, white and red lamps—is sufficient for landing without any other aid. In addition, as mentioned above, each plane carries complete equipment of landing lights and flares of its own. In this case also, either one of the devices is sufficient for making a perfect landing.

Consequently, there is always a quadruple factor of chance in the illumination system during a landing, and the four of them worked together will insure a landing as safe as that in daytime. In this connection it is interesting to mention that every night landing has been carried out with perfect safety and without the slightest damage whatsoever.

Junkers G-24 three-engine airliners of the Berlin-Moscow night service at Tempelhofer Airport.

Highlights of the Paris Show

Progress in Airplane Design Indicated in Certain Fields.

By JOHN JAY IDE

Technical Assistant in Europe, National Advisory Committee for Aeronautics

THE TENTH Paris Aviation Salon was held at the Grand Palais from Dec. 3-19, 1926. Fifty-nine airplanes and seaplanes were exhibited; of these, 52 were complete, the others being merely fuselages or center sections. The show was, of course, predominantly French, but the following foreign manufacturers were represented: British; Armstrong-Wentworth, Czech: Aero, Avia and Smolik, Dutch; Fokker and Kolbroch, Italian: Fiat.

The various classes of aircraft were represented by the following numbers:

Airplanes	
Pursuit	9
2 seater fighter	9
Observation and day bombing	10
Night bombing	3
Training	9
Ambulance	1
Transport	8
Total	49
Seaplanes & Marine Airplanes	
Observations	5
Torpedo	1
Training	1
Transport	3
Total	10

There has been great progress made in military aviation since the 1924 Show and this is particularly apparent in the pursuit class. Two years ago a number of machines were shown which were equipped with 300 hp. engines. These airplanes which included the Nieuport 29, Blériot-Spad 81 and Dewoitine D.1 are now obsolete and have been replaced by airplanes with engines of from 450 to 500 hp.

Jockey Pursuit Planes

In addition to this category there is now appearing a new class of pursuit airplanes popularly called the "Jockey" class in which speed and maneuverability are given precedence over armament. To assist the manufacturers to obtain the desired qualities, the government permits the gasoline tank protection to be omitted and the duration to be reduced from 2 to 1½ hr. Also the number of guns is reduced from 4 to 2. The only airplane of the "Jockey" class actually exhibited was the Nieuport 48, illustrated herewith. But several other constructors are building machines in this category.

The only pursuit airplanes of all-metal construction including the wing covering were the Bernard 12 and Wibault 7. However, the Loire-Guordou-Leseurre 32 and 35 have all-metal structors covered with fabric. The Wibault 7 is entirely of duralumin, the fuselage being built up of L and T section frames covered with corrugated duralumin sheet, the wing

IN THE PARIS AERO SHOW. Top, left, the Nieuport-Delage 48 C.1 (Hispano-Suiza, 400 hp.) pursuit plane of the new "Jockey" class. Right, the Besson MB. 36 (three 420 hp. Jupiters) transport flying boat. Bottom, left, the Villiers 5 (Lorraine-Dietrich, 450 hp.) two-seater night fighter. Note the flame dampers over the exhausts. Right, the Farman F.160, Goliath type, (two 500 hp. Farmans) night bomber. The cowling of the wing engines is noteworthy.

The Czechoslovakian Avia B.H.11 low-power two-seater touring plane (Walter, 60 hp.)

structure being likewise covered with duralumin sheet attached to the ribs by pleats.

Blériot showed the holder of the world's height record of 40,820 ft., a slightly enlarged edition of the Spad 61 but with a supercharged 450 hp. Lorraine engine.

Both the Nieuport 42 and 48 have wood monocoque fuselages, spruce wing ribs, duralumin spars and struts and cloth covered wings. Of the two Bernard machines, the type 12 is entirely of duralumin and the type 15 of wood. The Fiat C.R.20 has a fuselage with steel tube longerons and duralumin fairing strips. The box section wing spars are all steel and the ribs of duralumin.

The expansion in the two-seater fighter category within the last two years has been extraordinary. In the 1924 exposition the Koolhoven F.K. 31 and the Nieuport 42 C.2 were the sole two-seater fighters whereas at the 1926 Salon no less than eight manufacturers exhibited airplanes in this class.

The Avimeta

One of the new machines is the Avimeta A.V.M. 88 parasol monoplane illustrated in AVIATION of Dec. 27. This airplane is built by a subsidiary of the Schneider Company entirely of Alférium light alloy, and is equipped with a high compression V type Hispana-Suiza engine which develops 595 hp. at 2000 r.p.m. The fuselage is built up of four longerons and a number of transverses; the wing spars are lattice girders. The covering of the entire airplane is of Alférium ribbed longitudinally and riveted to the structure. The airplane is equipped with six machine guns.

Koolhoven exhibited the F.K. 35 low wing monoplane which, by adding an upper wing, can be converted from a two-seater fighter into an observation biplane. Koolhoven has invented a mechanical gun turret designed to overcome the difficulty of operating the ordinary ring mount at high speeds. In this invention the principal of the inertia engine starter is utilized there being a flywheel which is set in motion by hand or foot and which rotates at 16,000 r.p.m. The gunner sits inside a cylinder with a vertical axis, the whole cylinder being rotated by the flywheel by means of a clutch and gears.

The Villiers 5, is a two-seater night fighter having a wooden fuselage and wings and a single duralumin tube interplane strut on each side of the fuselage. It will be seen from the photograph that the exhaust pipes of the 450 hp. Lorraine engines are equipped with flame dampers.

Observation Planes

Almost all the observation airplanes exhibited are well-known. Among them was a Bréguet XIX, especially adapted for long distance flights and which holds the World's non-stop record of 3355 miles in 32 hr. from Paris to Djask (Persia). This machine differs from the standard type by having the cockpits moved rearward to allow more space for fuel tanks. The cut-out in the center of the trailing edge of the top plane has been omitted and the tail has been increased in size.

Potez also showed a "grand raid" machine, the 28, which for a time held the non-stop record with the Paris-Basra flight.

The Smolik S-16 biplane is the first Czech airplane having an all-metal structure, the fuselage being of steel tubing and the wings and tail of duralumin.

Fokker showed the well-known C.V.D. type fitted with a 500 hp. Hispano-Suiza engine.

Only three bombing airplanes were exhibited at the Salon; the S.E.C.M. 120, Farman 160 and Dyle and Bacalan D.B. 10. The S.E.C.M. 120 is a single bay biplane with a fuselage of duralumin tubes. In the nose is a 650 Lorraine engine fitted with flame dampers. The Farman 160 illustrated herewith is a slightly enlarged edition of the "Goliath" bomber, and has two 600 hp. Farman engines in very nicely streamlined nacelles. The typical Farman "pantaloon" type undercarriage is used.

The Dyle and Bacalan is a new monoplane with a very thick center section between the two 420 hp. Jupiter engines allowing access to them in flight. The fuselage is of duralumin tubing. The wing spars are of steel and the ribs of duralumin. Only the center section of this machine was exhibited.

Nine training airplanes were on view including three types each exhibited by Caudron and Morane-Saulnier, and one each by Avia, Hanriot and Smolik.

Of the eight transport airplanes on view four were single engined (Bicherean 7, Bréguet 26, Farman 170 and Levasseur 7); two were twin engined (Blériot 165 and Lioré-Olivier 21), and two three-engined (Fokker F VII 3m and S.E.C.M. 150).

Small Transports

Of the single-engined machines the Farman 170 has been used throughout 1926 on the Paris-Berlin route. The cabin accommodates six persons of whom three, however, face backward. The Bréguet 26 is a new type having a cabin for six persons. It is to be superseded shortly by the type 28 which will carry eight passengers. The Levasseur 7 has a very spacious cabin for five passengers, designed by the well-known automobile body builder Gaston Grummer.

In the cabin of the Bleriot 165 are sixteen seats three in a row. This airplane which has two "Jupiter" engines replaces the four engine type 155. The Loiré-Olivier 21 is an adaption of the type 20 bomber and carries 17 passengers in two cabins.

The Fokker F VII 3M is practically identical with the machine Commander Byrd used in his North Pole flight, but with three Siddeley Lynx engines instead of Wright Whirlwinds. The other three-engined transport machine exhibited, the S.E.C.M. 150 also of the monoplane type, was unfinished.

The following service seaplanes and marine airplanes were exhibited at the Salon: Besson 35, Bréguet XIX and Farman 150 twin float seaplanes, C.A.M.S. 37 flying boat amphibian, Levasseur 4 and Villiers 2 marine airplanes.

The Besson 35 is a small low wing monoplane designed to operate from a submarine like the Heinkel seaplanes bought some years ago by the United States Navy. The Bréguet 19 is a standard landplane mounted on two duralumin floats having a cross-section of the type designed by Commander Richardson. The C.A.M.S. 37 is a biplane flying boat with folding wings and amphibian gear. The bow resembles the lower part

of the nose of an airship control car having a projection with triplex glass panels permitting a direct downward view. The Levasseur 4 and Villiers 2 marine airplanes have watertight plywood covered fuselages and releasable landing gears.

The following three transport flying boats were shown: Besson 36, Loiré-Olivier 190 and Schreck F.B.A. 21. The Besson 36 of which a photograph is given, is a large monoplane with three Jupiter engines. Fourteen passengers are accommodated in hull. The Loiré-Olivier 190 and Schreck F.B.A. 21 are single engine biplane flying boats, the latter equipped with amphibian gear.

Popularity of the Radial

One of the features of the Salon is the widespread use of high-powered radial air-cooled engines. The Gnome-Rhone Company has just produced a new model Jupiter which can be supplied either with or without a two to one reduction gear. The new engine while having the same sized cylinders as the earlier models develops 480 hp. at 2000 r.p.m. with limited throttle, and gives a maximum of 608 hp. at 2175 r.p.m. In the new engine the overall diameter has been reduced four inches by interlacing the cylinders. The crank case is a forged duralumin production instead of the casting previously used.

The success of the Jupiter has caused the Salmson and Lorraine-Dietrich companies to bring out high powered air-cooled radial engines. In the new Salmson 460 hp. model the 18 cylinders are in two rows, the rear cylinders being directly behind the front ones instead of being staggered as is the more usual practice. In order to equalize the temperatures of the front and rear cylinders each pair is connected by ribs. Lorraine-Dietrich has produced two air-cooled engines, the 220 hp. 7-cyl. and 450 hp. 14-cyl. models, and their general designs follow Armstrong-Siddeley practice. In addition to the air-cooled models the Lorraine-Dietrich Company continues its range of famous water-cooled types, of which the highest powered model develops 800 hp.

The Renault Company showed three new 12 cylinder V-type engines derived from the 420 hp. models which won last year's engine competition. They are rated at 450, 550 and 700 hp.

The Caffort engine was the most original one exhibited at the Paris Salon, and is as yet in the experimental stage. It is a 12-cyl. engine of the horizontally opposed type and is made of aluminum alloy. There are four valves per cylinder, and each valve has three concentric springs. The valves are operated by push-rods from camshafts in the crank-case. The reduction gear gives a propeller spread of 1060 r.p.m. at an engine speed of 2000 r.p.m., at which 5000 hp. is developed. The bore and stroke are 145 mm. and 150 mm. the compression 5, and the weight 1100 lb. One great advantage in this engine is its low head resistance, it being particularly well adapted for placing inside a thick wing.

Farman displayed their well-known 500 hp. 12-cyl. and 700 hp. 18-cyl. engines and Panhard two sleeve valve models, both with 12-cyl. in two banks. Hispano-Suiza showed their famous 12-cyl. 500 hp. W and V types, and also the new 12-cyl. 400 hp. model which is a high compression (6.2) version of the standard 350 hp. and is being used in the new "Jockey" class of pursuit airplanes.

Among the foreign engine manufacturers Great Britain was represented by the Armstrong-Siddeley and Bristol companies, Czechoslovakia by Breitfeld, Danek and Walter, and Italy by Fiat and Isotta-Fraschini.

New President of Splitdorf

Of interest to the aircraft field because Splitdorf magnetos have been used in American aircraft engines for many years, is the news of the appointment of Edward H. Schwab, a brother of Charles M. Schwab of the Bethlehem Steel Corporation, as president of the Splitdorf Electrical Company at the November meeting of the Board of Directors. He succeeded M. W. Bartlett who has retired from the business.

Mr. Schwab has been chairman of the Splitdorf Board since 1924 when the Company, which was founded in 1858 and is one of the oldest electrical concerns in the country, joined forces with its principal competitor in the spark plug field, the Bethlehem Spark Plug Company, of which he was president. The amalgamated company has since produced the nationally advertised Half Dollars Spark Plug, sales of which have exceeded the combined peak performance of the two former competitors.

Besides its important radio and spark plug business, the Splitdorf Company is one of the leading factors in the manufacture of magnetos, for motor buses, trucks, tractors, aeroplanes, motor boats and similar power units. Important developments in this field are in progress, according to Mr. Schwab, who has announced that the company will pursue a policy of steady expansion in the automotive, electric and radio branches of the business.

It was also announced that R. W. Porter, a widely known sales executive, has been appointed General Manager of the Company. Mr. Porter was formerly radio sales manager, and was previously associated with the Winchester Repeating Arms Company, the Columbia Phonograph Company and the R.E. Thompson Manufacturing Company.

The Czechoslovakian Avia B.H.26 two-seater fighter (Jupiter, 420 hp.)

Paris Holds Tenth Aero Exposition

Fifty-Nine Airplanes and Seaplanes at 1926 Paris Aero Show.

By LADISLAS D'ORCY

THE 10TH Paris Aero Show, which was held from Dec. 3 to 19, 1926, at the Grand Palais des Champs-Elysées, deserved, far more than its predecessors, the appellation "international", for British, Czechoslovak, Dutch and Italian aircraft were exhibited alongside French machines. Germany was not represented, for that country's admission to the League of Nations occurred too late to secure floor space for German aircraft, though as a matter of fact a beautifully finished scale model of a Dornier Komet was exhibited on the stand of the Farman Air Lines. America was absent, too.

First Impressions

The first thing that struck one on visiting the Salon was the total absence of freak machines. If all the airplanes exhibited had not actually flown, at least it may be said that there was none that looked as if it could not fly, not excluding that huge speculative aircraft, the Penhoët transport flying boat with five 420 hp. Jupiter engines, which actually has flown. As this machine was too huge to enter the Grand Palais, a wash drawing of it, 150 ft. by 30 ft., was shown.

The second noteworthy thing was the large proportion of airliners, both land and sea types exhibited. There were four military or training airplanes for every transport machine, and all the airliners, with the exception of the three-engined Fokker, were of French manufacture. This would seem to show rather convincingly that French aircraft manufacturers—and the powers that be in France—have at last realized the danger of considering commercial aviation as a negligible side issue and that they are going to challenge Germany's avowed superiority in this field. Not so long ago nobody in French aircraft circles would admit this superiority. How much the wind has changed of late may be gathered from the fact that the annual report on the Aeronautical Budget, which was distributed in the Chamber of Deputies a few days before the Show opened, contained the following significant lines:

"The inferiority of French commercial aviation is chiefly due to three causes: first, the lack of comfort of French airliners; second, the following of military rather than of commercial considerations in the design of French airliners (which reduces their earning power); and third, the lack of satisfactory transport seaplanes."

The great majority of airliners, shown at the Salon illustrate the timeliness of this warning, for, with two or three exceptions, they are all either adaptations of bombers or else designed with a view to their being convertible into bombers.

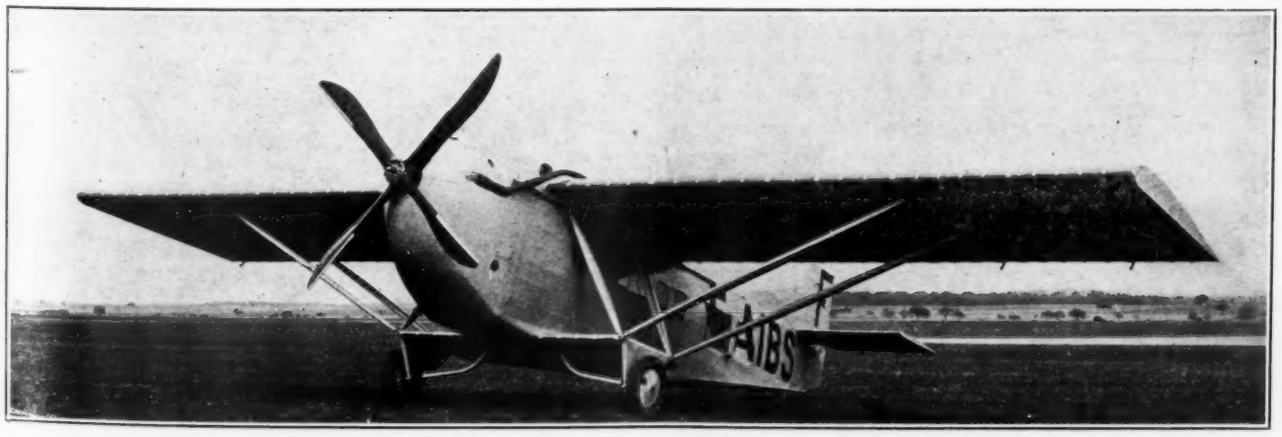
Now, there is no getting away from the fact that even the most amazing military airplane will at best prove a commercial disappointment when fitted as an airliner. The reason is obvious enough. First, the best military machine of its class cannot have the best commercial performance and vice versa because the respective requirements differ too much; and second, the fuselage of a military machine can at best only be adapted to commercial needs, and here to adapt means to sacrifice comfort and convenience.

The uncomfortable and inconvenient airliners of which the *rapporteur du budget*, Deputy Paté, so justly complains, are mainly the result of such adaptations: bracing tubes that cross the cabin; bracing wires that have to be tightened after the cabin door is shut; more bracing wires that cross in front of the windows and so annoy the passenger's vision; small size windows or portholes due to structural reasons; and yet more bracing tubes and wires that hinder the access of the baggage hold, not to speak of crammed passenger accommodations due to limited cabin space. Air travel is sufficiently novel that everything should be done to break down the passenger's instinctive difference when he steps into an airliner, and to make him feel really comfortable as he would in a Pullman car.

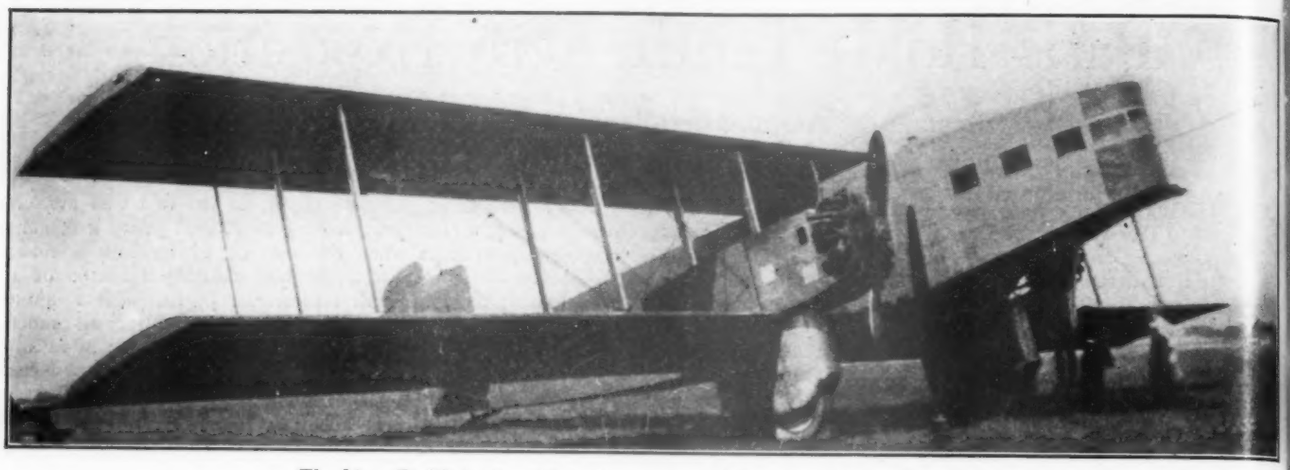
These are considerations that have so far been generally overlooked by French aircraft manufacturers. But, as was said before, there were at the Salon a few machines which formed an exception to this rule and which struck one as holding the germ of real airliners.

A Real Airliner

One French machine stands out in this respect far above the rest, namely, the Levasseur 7T (420 hp. Jupiter) transport airplane, which justifies the saying of its constructor that instead of squeezing a passenger cabin into a fuselage he simply built an airplane around a limousine body. The result is that the six passengers are seated in deeply upholstered arm chairs with all the comfort found in a high class limousine. Such a comprehensive bodywork naturally takes more weight than bare wicker chairs; but some airline operators are beginning to wonder whether lack of comfort more than any other consideration is not keeping the businessman away from air transport. It is, likewise, a meet question whether a man, who pays an air fare far in excess of any railroad fare to fly from Paris to Constantinople and who, beside other risks, takes in that of being held up by bad weather, is not entitled to comfortable quarters on board an airliner.



The Farman 170 six passenger airliner (Farman 500 hp.), a single-engine modification of the Jabiru which had engines on the lower wing stubs above each wheel.



The Liore Et Olivier Leo. 21 twelve-passenger airliner (two Jupiter 420 hp.)

Constructionally, the Levasseur 7T is a single-bay tractor biplane, with timber-framed and fabric-covered wings of the folding type. The fuselage is of the type of construction peculiar to this firm and has stood the test of time in the numerous marine airplanes the Levasseur Co. has supplied to the French Navy. In these machines two stout N girders built up of plywood as continuous units running from the engine section to the sternpost form the sides of the fuselage, while the top and the bottom are formed by plywood struts, covered with veneer. This construction, which does not entail the use of any metal fitting, is very strong, light and cheap to build and to repair. The roof of the cabin is built in the shape of a hull, with a top ridge, to give additional safety in case of a bad landing. To deaden the sound of the engine and also to reduce the fire hazard, a sheet of asbestos is inserted between the double walls of the cabin. Owing to the type of construction used, the windows are of unusually large size and should give passengers a magnificent view of the world below without being annoyed by bracing wires. The pilot's cockpit is situated right after the engine, and behind it there is a separate compartment for the radio operator.

Although the Levasseur 7T has not yet flown, it is of interest to note from the aerodynamic standpoint the machine is not unlike the Levasseur 4R3 shipboard reconnaissance three-seater which is in extensive use in the French Navy and which was also exhibited, together with the new P.L. 6C2 two-seater fighter.

Other French Airliners

Among the other airliners of French construction there were three that have just been adopted by the Air Union for its Paris-London and Paris-Marseille services, where they will gradually replace the absolute Goliath and Spad 56. These are the Blériot 165, the Bréguet 26T and the Lioré et Olivier 21T.

The Blériot 165 is the twin-engined version (with Jupiters) of the four-engined transport machine, two of which were on the Paris-London service last Summer. The machine is timber-framed throughout and the cabin, which alone was shown, has beautiful leather panels on the walls, and neat, but small, triangular, hinged windows. The cabin holds fifteen passengers in very narrow wicker chairs which are placed three abreast, with a passage-way between.

Military Machines Commercialized

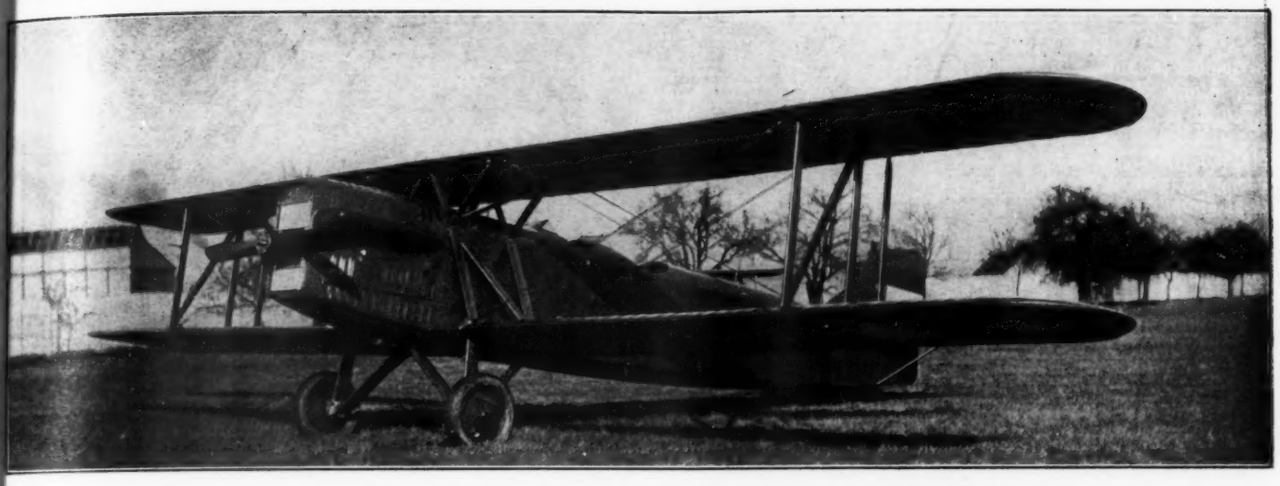
Structurally, the Lioré et Olivier 21T is just as conventional and may best be described as a "cleaned-up" edition of the well-known Goliath, except for a duralumin framework, which is novel. The 21T is merely a commercial adaptation of the LeO 20 bomber, and carries six passengers in the forward cabin and twelve in the rear cabin. The machine has chiefly been adopted by the Air Union because of its excellent weight carrying ability and good performance.

The Bréguet 26T is the commercial adaptation of the well-known Bréguet XIX observation-bomber, with the same pin-jointed and riveted tubular fuselage structure and sheet duralumin wing frames. The cabin portion of the fuselage is plywood covered.

It is noteworthy that these three machines are fitted with Jupiter engines, which shows the popularity of this power plant among French airplane constructors.

Another thing that seems worthy of comment is that two out of the three new types which the Air Union has adopted for its new fleet should have metal frameworks. This is in keeping with the recently adopted policy of the company to encourage the development of all-metal aircraft, which, in the words of its technical director, M. Henri Bardel, afford the only possible solution to the problem of depreciation of commercial airplanes. He holds that even though the Goliaths of the Air Union can, today, be flown for a greater number

The Liore Et Olivier Leo. H.190 six passenger seaplane (Jupiter 420 hp.). The type is used on the Antibes-Ajaccio service and is the machine used by Lieutenant Bernard on his recent flight from Etang de Berre to Madagascar across central Africa.



The Czechoslovakian Letov (Smolik) S.16 day-bomber (Lorraine-Dietrich 450 hp.)

of hours (800 hr. without top overhaul as against 300 in 1923) than some of the German all-metal monoplanes which, after 450-500 hr. service, have to be stripped of their metal covering and resurfaced, this apparent inferiority is merely due to lack of extended experience with this type of construction and not to any inherent defect of metal covering.

It will be interesting to watch in this respect the future policy of the Farman Air Lines which are running the Paris-Cologne-Berlin service in conjunction with the Deutsche Luft Hansa, the latter using Junkers G.24's while the Farman company uses its own F.170 timber-framed and fabric-covered monoplane.

The F.170, with the geared-down 500 hp. Farman engine, was exhibited on the Farman stand. This is a raised-wing monoplane of the strut braced type. Its construction is very conventional, but its performance is uncommonly good, seeing that the machine can fly with eight passengers and a pilot with three-fifth engine power (300 hp.) at a cruising speed of 150 km. p. hr., while carrying fuel for five hours.

A Three-Engine Airliner

The S.E.C.M. exhibited the skeleton of the fuselage and the center section of its new transport machine, type 150. This is a cantilever monoplane fitted with three 350 hp. Hispano-Suiza engines (one in the nose and two in the wings) and is designed to carry fourteen passengers at a cruising speed (9/10th power) of 190 km. p.h. for a distance of 1,000 km. The machine will be built of steel and duralumin tubes assembled in sheet sockets of the split type by means of riveting. In the cabin portion, the transverse bracing is insured by pressed steel frames which leave a totally unobstructed space for the passengers, though it does seem that, if fourteen are to be carried, the cabin will not be any too large to accommodate them in comfort.

The center section of the machine is, likewise, built of duralumin tubing. Instead of ordinary wing spars there is a central box girder of huge proportions which is formed by six contour spars situated along the wing surfaces and the necessary bracing members. The wing engines are accessible through this box girder.

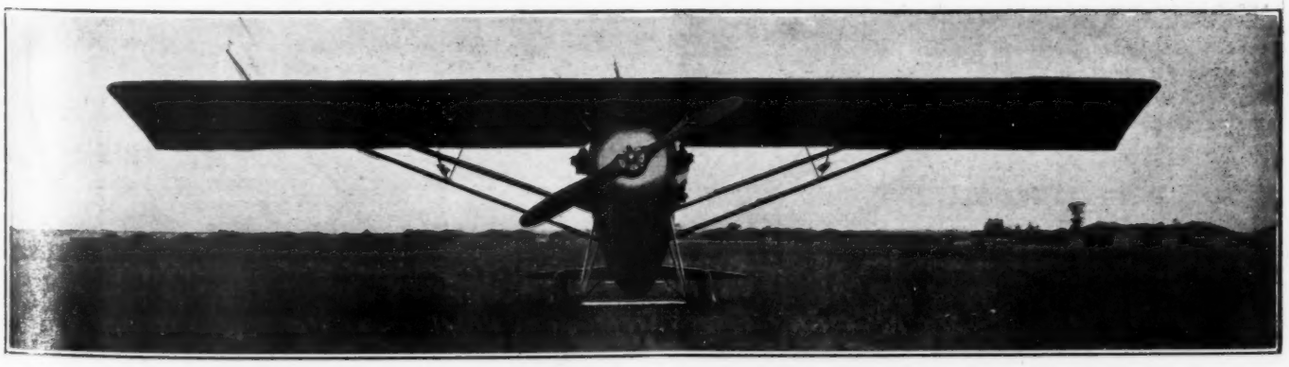
Last, but not least, there remains to be mentioned the Fokker F.VII-3m (three 185 hp. Siddeley Lynx) transport airplane. As this machine is almost identical with Commander Byrd's "Josephine Ford" of Polar fame, it seems unnecessary to go into details about it. The fuselage is of welded steel tubing (the only one at the Show, by the way), for neither the French, nor the British, nor the Czechoslovak technical departments fully approve of welded steel tubing, while the wings are of timber and plywood. The machine is a very comfortable and beautifully finished job.

Transport Seaplanes

While France has, during the past few years, made a large number of rather costly efforts to develop a really efficient big transport seaplane for the projected trans-Mediterranean services, it is generally admitted that, so far, these efforts have not produced any tangible result. The Salon seemed to justify this outlook.

The huge Penhoët flying boat with five Jupiter engines [described in AVIATION of Dec. 13, 1926.—ED.] was only represented by a painting, as remarked before, and that did not disclose anything startling save its very large size. Neither could any but a general idea be had of the Météore 63 (three 180 hp. Hispano-Suiza) and the Lioré et Olivier 15 (three 420 hp. Jupiter) flying boats which finished first and second, respectively in the last Seaplane Transport Competition, for only scale models of these machines were shown. However, it appears from reports that the Météore, with which an experimental air mail service is being run between Marseille and Algiers via the Balearic Isles, is proving quite serviceable.

The Besson firm exhibited a transport flying boat, fitted with three Jupiters, which is intended for fourteen passen-



A front view of the Liore-Gourdou-Leseurre 32-C1 pursuit plane (Jupiter, 420 hp.)

The Liore-Gourdou-Leseurre 32-C1 pursuit plane (Jupiter, 420 hp.)

gers. The hull, of timber construction, has very fine lines, but the wing structure, shown stripped, does not inspire much confidence in its strength and looks as if it had been improvised for the Salon. This company may be remembered as having produced, some years back, a huge quadruplane flying boat which actually flew, but was not further developed.

Two single-engined flying boats which would seem useful types for air mail feeder lines were the F.B.A. 21 HMT (450 hp. Lorraine) and the Lioré et Olivier H.190, (420 hp. Jupiter). Both machines are orthodox, strut-braced biplanes of timber construction. The F.B.A. carries four passengers in a bare open cockpit aft of the wings, the pilot being seated in front of the wings, underneath the engine which drives a tractor propeller. The sheet steel fittings which connect the engine mounting to the "W" type bracing struts did not strike your correspondent as being particularly sturdy, though, as a matter of fact, this and previous types of F.B.A. flying boats have a long and excellent record of service. The type 21 won the 1925 competition for French Transport Seaplanes.

The LeO H.190 is just as orthodox in construction, but gives an impression of much greater sturdiness, though the machine has clean lines. Here, six passengers are carried in a cabin situated in the forward portion of the hull, access to which is had by means of a hatch. The pilot and the radio operator are accommodated aft of the wings, as is a Bristol starter engine. This machine too has a tractor propeller.

Military Airplanes

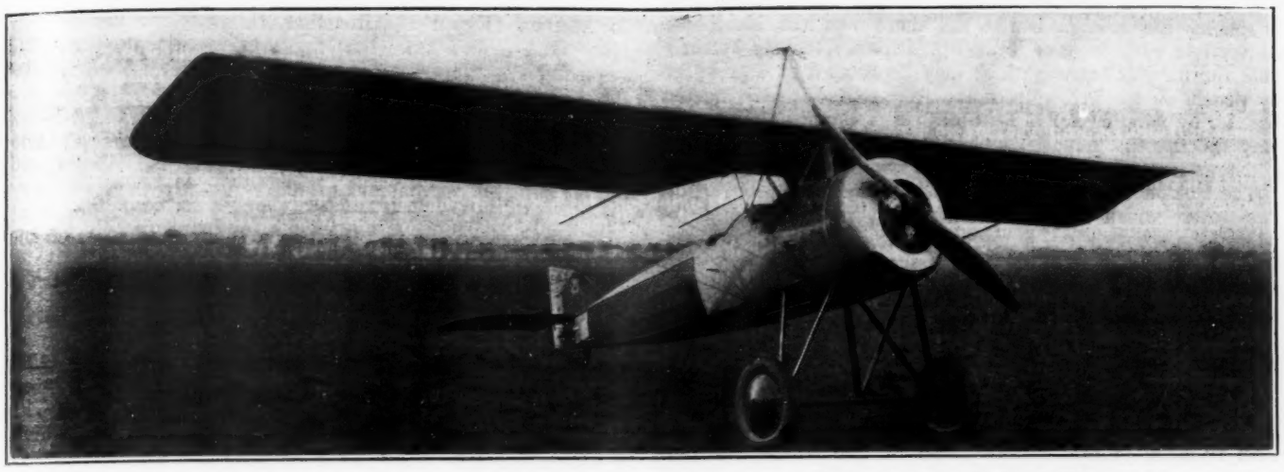
Having thus exhausted the list of transport airplanes shown, we may tackle the military exhibits.

By right of tradition, pursuit planes come first. Among these, the outstanding product, for sheer beauty of design and superior performance, was the new Nieuport-Delage 48 "Jockey" single-seat fighter, with a 400 hp. Hispano-Suiza engine. This machine is what is called a "light fighter" on account of its greater speed at low altitudes but slower climb than the high altitude fighter, which was represented on the same stand by the Nieuport-Delage 42. A small production for the latter type was recently placed by the French Military Air Service.

The Nieuport Pursuits

The two Nieuports are almost identical in construction. The fuselage is a tulipwood monocoque, built in two halves, which is reinforced in the portion extending from the nose to the cockpit by an internal sheet duralumin framework to which the shell is bolted. This framework also serves as an engine bed. The raised wing of both types has duralumin box spars and plywood ribs, while the lower winglets of the Ni.D.42 are integrally built of plywood. The cabin struts are duralumin tubes and the undercarriage and the wing bracing struts are two sheets of duralumin pressed out into a perfect streamline and riveted together. This machine is delivered with fabric or with metal covered wings.

The Liore-Gourdou-Leseurre 33-C1 pursuit plane (Lorraine-Dietrich, 450 hp.)



The Morane-Saulnier 35 E.P.2., a training plane of somewhat primitive appearance. The engine is an 80 hp. LeRhone rotary.

Another single-seat fighter of outstanding merit that was shown was the Wibault 7C.1 (420 hp. Jupiter). This machine, which has been adopted by the French Navy and the Chilian Air Force, is a strut-braced parasol monoplane of very clean lines. The Wibault 7 is entirely built of metal, duralumin being used for both the structure and the covering of wings and fuselage, while the wing bracing struts and the undercarriage struts are steel tubes. The wings have tubular spars and channel section lattice ribs, the web of which extends beyond the wing contour and serves as an anchorage for the wing covering. The latter comes in strips corresponding in width to the rib spacing and is flanged so that it can be fixed to the web. This is done by driving the rivets through a "U" shaped strip which covers both the ridge of the rib and the flanged strips of either side. [This type of construction was described in the June 14, 1926 issue of AVIATION—ED.]

Although the Wibault is not such a fast plane nor such a good climber as the Nieuport 42, it corresponds to different requirements for the Wibault carries more than twice the useful load of the Ni.D.42.

Another pursuit plane with a notable performance is the Fiat C.R.20 (400 hp. Fiat), which was recently adopted as the standard fighter of the Italian Air Force. In point of fact, this machine is, with the exception of the Spad 61 altitude type, probably the fastest fighter in Europe. It should be noted that Callizo's altitude record breaking plane is not the standard pursuit plane.

The Fiat CR.20 is a Warren-trussed biplane of metal construction, with sheet steel wing spars, duralumin ribs and a steel tube fuselage over which is built a fairing of duralumin lattice work.

There remain to be mentioned among the single-seat fighters the Loire-Gourdou-Leseurre machines, one fitted with a 420 hp. Jupiter and the other with a 450 hp. Lorraine; and the Bernard (S.I.M.B.) 15C.1 with 500 hp. Hispano-Suiza. The L.G.L.'s are of the well-known parasol type developed by this firm, with duralumin spars, wooden ribs and a steel tube fuselage. The Bernard 15C.1, a new product has a well streamlined plywood box fuselage and the wings are also plywood covered. This machine has not yet passed its official flying trials.

Blériot exhibited the Spad 61 type in which Callizo established the latest World altitude record and which is an adaptation of the standard Spad 61 fighter.

Two-Seater Fighters

Following the issuance, by the French Air Department, of a new program for two-seater fighters, several machines of this type have appeared of late. They were almost all at the Salon.

The most novel in appearance was undoubtedly Captain Lepère's latest product, the Aviméta 88, a strut-braced parasol monoplane of *Alférium* construction and of very impressive lines. The metal is used in its simplest forms, straight sheets corrugated for local stiffness, and angle sections, and is united by riveting. The fuselage is simply built up of formers and angle section longerons to which the metal skin gives additional strength. The wing spars are lattice girders. The landing gear consists of two outwardly inclined, well streamlined struts, each carrying a wheel, with the shock absorbing device housed in the struts.

As this machine is of an entirely novel design, it is hardly astonishing that it should be heavier, in fact, much heavier, than its contemporaries of more orthodox design.

On the other hand, there were enough machines with duralumin structures at the Salon to show that this type of construction need be no heavier than timber construction. Striking examples in this respect were the Descamps 17 and the Mureaux 3 two-seater fighters, which can be considered together as they were designed in the order named by M. Brunet, formerly of the Bréguet company where he put the finishing touches to the Bréguet XIX and industrialized its design for mass production.

Tubular Construction

The Mureaux 3 being M. Brunet's latest creation, unusual interest attaches to it quite naturally. The fuselage structure, consisting of four tubular longerons and the necessary struts which meet at right angles and are joined by riveted sheet sockets, while diagonal bracing struts have their flattened ends riveted onto lugs provided on the strut sockets—is the simplest and most logical form of tubular construction the writer has seen so far. It certainly must be much cheaper and quicker to build than most other designs. A light framework of channel section stringers and formers which is superimposed on this main frame, serves to streamline the fuselage. The wing spars are highly original and consist of two flat sheets of duralumin, flanged top and bottom and reinforced there by horizontal strips of varying thickness. These two sheets are held apart at less than 1 inch distance by a great number of tubular spacing elements through which they are riveted together. This solution does not strike one as being adaptable to quick production, nor of being particularly cheap. The wing ribs are of channel section. A very high performance is claimed for the Mureaux 3, but flying trials have not yet been completed. The Descamps 17, by the way, has an unusually fine performance.

The Levasseur 6C.2 (500 hp. Hispano-Suiza) is a well streamlined biplane of the type of construction described in connection with the new airliner of this firm.

The S.R.A.P. fighter, built to the designs of M. Béchéreau, the creator of the famous Deperdussin and Spad airplanes, is a rather sad reminder of the fact that some of the great aircraft designers of the past have failed to keep in step with progress these latter years.

The Villiers type V two-seater night fighter (450 hp. Lorraine) is a single bay tractor biplane, with an oval section, plywood fuselage and fabric covered, wooden wings. The lower wing is of very narrow chord, to allow for maximum visibility.

Among the foreign contingent there was the Koolhoven convertible mono-biplane (420 hp. Jupiter), chiefly remarkable for its gun turrent which may be rotated at high speed by pedals on the principle of the Aeromarine inertia starter, that is, by winding up a flywheel. It is claimed that in this way the turrent may be quickly turned at any wind speed and that it can make a full turn in two seconds.

The Fokker company exhibited the Fokker C.V. convertible two-seater, which may be fitted with two different sets of wings, one for fighting, gun spotting and photographic work, and the other for distant reconnaissance and bombing. The machine follows the well-known principles of Fokker construction.

The Avia B.H.26 two-seat fighter (Jupiter) is a timber-framed biplane of orthodox lines for which a very good performance is claimed.

The Armstrong-Whitworth Ajax (385 hp. Jaguar) is a machine of conventional, but pleasing lines, with a structural steel fuselage (fabric covered) and wooden wings. Its performance is very good.

Distant Reconnaissance Airplanes

Coincident with the appearance of two-seater fighters, as distinct from the well-known class of A.2 corps observation machines, it would now seem as if the latter were about to stretch out and evolute away into what have come to be called *avions de grande reconnaissance* (distant reconnaissance airplanes).

The two great French specialists of A.2 (corps observation) airplanes, Bréguet and Potez, both exhibit their respective machines with which French pilots set up this year an astonishing series of new world straightaway distance records, flying from Paris either in the direction of the Persian Gulf or of Siberia. For these flights, the machines were naturally stripped of all military gear so as to carry every possible ounce of gasoline. However, it should not be thought that these machines are freaks which cannot be used for military purposes. The remarkable thing about these record flights is precisely that they were carried out with standard observation machines which had only undergone minor modifications, such as the fitting of additional tanks, the shifting of the seats, the filling in of the upper wing cutout and the use of slightly enlarged tail surfaces.

The Bréguet XIX is too well-known to necessitate describing it, but it will be of interest to note the weight schedule of the machine, exhibited at the Salon, on which Lieutenant Costes and Captain Rignot made the last World record by flying from Paris to Djask (Persia), covering a distance of 5,400 km. in 32 hr.:

Weight equipped	1,518 kg.
Weight of crew, food and baggage	250 kg.
Weight of gasoline and benzol	2,209 kg.
Weight of oil	180 kg.
Weight, loaded	4,157 kg.

The machine exhibited at the Salon not only made the Paris-Djask flight, but also was flown from Paris to Omsk (Siberia) by Captain Girier and Lieutenant Dordilly (4,700 km. in 27 hr.) and was used in the attempt at the World record by Costes and de Vitrolles when they flew from Paris to Asseuan (Egypt). Altogether, this machine has covered more than 40,000 km. (the length of the Equator) without requiring any repair or change of the engine, a 500 hp. Hispano Suiza.

The opposite number of the Bréguet XIX G.R. is the Potez 28 G.R. (550 hp. Renault) with which the Arrachart brothers flew from Paris to Basra (Iraq), covering 4,300 km. in 26 hr. 30 min. A comparison of the two machines is not very conclusive as they neither possess the same wing area, net weight or engine power. Here is the weight schedule of the record breaking Potez 28 G.R.:

Weight empty	1,900 kg.
Weight of crew and equipment	240 kg.
Weight of fuel (gasoline and oil)	2,630 kg.
Weight loaded	4,770 kg.

The Potez machines, whether 25 A.2, 25 G.R. or 28 G.R., all have timber framed, fabric covered wings with steel interplane struts. The undercarriage is of duralumin tubing, with rubber disc shock absorbers, a type of undercarriage which, incidentally, this constructor originated. The fuselage is built up on four wooden longerons and struts, the central portion being plywood covered, while the rear portion is covered with fabric. To the front portion of the fuselage may be attached any of two types of standard engine mountings, made of pressed sheet duralumin, one of which takes radial engines and the other either V or W types from 400 to 500 hp.

A third machine of the *grande reconnaissance* type was exhibited by the Caudron company which is better known for its training and touring airplanes. The Caudron 104 G.R. was fitted with a Jupiter engine. It is of classical timber construction.

Foreign constructors were not represented in this class, but mention should be made here of the regular two-seater observation machines exhibited by the Aero Co. and by the Military Aircraft Factory of Prague (Czechoslovakia). The latter's machines are now called "Letov," whereas up to now they were generally referred to, from the name of their chief designer, as "Smolik." The S.16 (450 hp. Lorraine) has a steel tube fuselage and duralumin-framed wings, both being covered with fabric. Its performance is distinctly good. [This machine and other Smolik designs were described in the Dec. 20, 1926 issue of AVIATION—ED.]

The Aero Co. exhibited its types A.11 (240 hp. Perun) and A.30 (450 hp. Lorraine), whicl. are classical tractor biplanes with steel tube fuselage and wooden framed wings. The A.11 has a remarkably fine performance for its low horsepower. No performance figures are available for the A.30.

Night Bombers

The family of night bombers was only represented by three machines or portions of them: (1) the Farman F.160, with two 500 hp. Farman engines, which is the latest version of the Goliath *militaire;* (2) the Dyle et Bacalan D.B.10, with two Jupiter engines, which looks as if its designer had started to copy the Remington-Burnelli and then decided to limit the airfoil shaped portion of the fuselage to the depth of the wings; and, (3), the S.E.C.M. Amiot 120 BN, with

(*Continued on Page* 88)

The Morane-Saulnier 129 E.T.2 (Hispano-Suiza 180 hp.) advance training plane. Note the Reed metal propeller.

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The Morane-Saulnier 132 two-seater training and touring monoplane (Salmson 120 hp.). The wing is swept back with rounded tips.

550 hp. Renault engine, which is a single bay biplane of very considerable proportions and metal construction of the type described in connection with the S.E.C.M. Transport, except that the wings have duralumin box spars.

The Dyle et Bacalan D.B.10 is also built of metal, steel tubing being used for the wing spars and the wing struts, duralumin tubing for the longerons and fuselage struts, and channel section sheet duralumin for the ribs.

Naval Seaplanes and Marine Airplanes

Of the naval seaplanes exhibited, perhaps the most interesting was the C.A.M.S. 37A (450 hp. Lorraine) fleet spotter amphibian, a single bay flying boat of clean lines which looks capable of serious work with the fleet. It carries a crew of three. The machine is of classical wooden construction, with folding wings for rapid stowage on board aircraft carriers. Speaking of the latter, the French Navy Department exhibited a well made scale model of the new French aircraft carrier "Béarn," now nearing completion, with various types of naval aircraft, amphibian flying boats and "marine airplanes" taking off from, or landing on, the ship's platform. The C.A.M.S. 37A was, incidentally, exhibited on the French Navy Department's stand, as was a Farman Goliath torpedo plane and a Besson M.B.35 (120 hp. Salmson) submarine scout. The latter, as its name indicates, is a folding wing machine for use on board submarines and is reminiscent of the Heinkel machine of this type with which the U.S. Navy Department experimented some years ago.

The Bréguet company showed one of its type XIX two-seaters mounted on floats for naval reconnaissance work. As a machine fitted with the same type of twin floats was built by the Nakajima Co., Bréguet's Japanese licensee, a couple of years ago, and said floats fundamentally differ from the usual French floats which are square box affairs, it may be presumed that the design of these floats came from Japan—having perhaps reached there from the United States. In fact, the floats, built of sheet duralumin with a central longitudinal bulkhead to which formers are attached on either side, follow typical U.S. Navy lines with their curved deck, the deep Vee and their great length.

Aside from naval seaplanes, there were exhibited at the Salon two "marine airplanes" which are the type of craft used in the French Navy for fleet fighting and fleet reconnaisance. These are really land machines fitted with a fuselage built watertight along its nose and lower portion and equipped with a droppable or raisable undercarriage, so that the machine will not turn over on alighting in the sea, but will float until picked up and hoisted on board. As a rule, the lower wings carry wing tip floats and the propeller can be locked in a horizontal position.

Two machines of this general class were shown: a Levasseur P.L.4 R3 three-seater naval reconnaissance biplane, and

A group of three Schreck F.B.A. 21's four passenger amphibian flying boats (450 hp. broad-arrow Hispano-Suiza)

a Villiers II bis two-seater fighter, both with the 450 hp. Lorraine engine. The P.L.4 followed the Levasseur type of fuselage construction and, as this machine has extensively been used by the French Navy and no complaints have been made regarding the water-tightness of its fuselage, it must be presumed that the plywood girders stand up very well in contact with sea water.

Touring and Training Planes

A word now remains to be said of the variegated family of touring and training airplanes which a humorist described as chicken coops for the discouragement of aerial locomotion. The three principal exponents of this class, Morane-Saulnier, Hanriot and Caudron, all exhibited, and so did two of the Czechoslovakian firms, Avia and Letov.

Morane Saulnier, besides showing its well-known primary and advanced training types, exhibited the model 132 (120 hp. Salmson) touring plane on which Warrant Officer Couret and Engineer Hirschauer made, last Spring, a pleasant joy ride tour of all the countries bordering the Mediterranean Sea. The machine is of timber construction, except for the wing spars which are duralumin tubes, and the undercarriage struts, which are steel tubes. The engine mounting is quickly detachable and is built of duralumin tubing. The Morane 132 has the reputation of being extremely nice to fly.

Other Exhibits

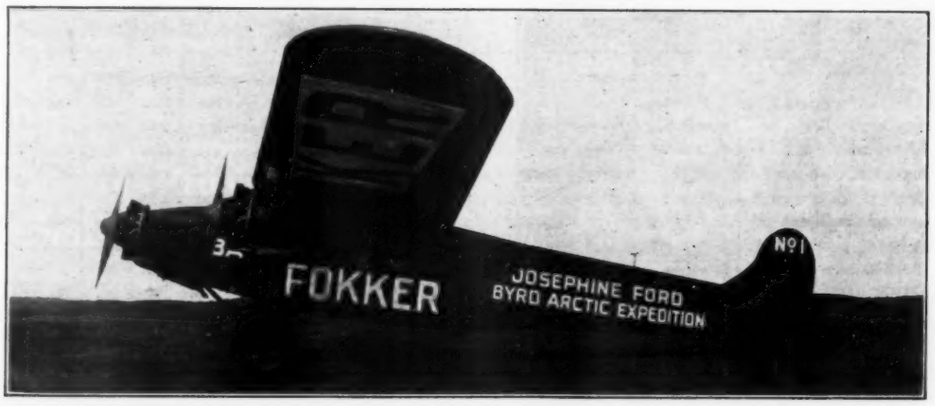
Among the other exhibits, may be mentioned the 180 hp. Hispano-engined ambulance planes produced by the Hanriot and Loire-Gourdou-Leseurre firms, which accommodate one stretcher case; the Avia B.H. 11 (60 hp. Walter) two-seater, famous for its numerous triumphs in lightplane competitions; the Letov S.18, fitted with the same engine and which looks businesslike; and the Caudron C.109 touring-training plane fitted with the new 60 hp. air-cooled Salmson engine.

These sketchy notes of the 10th Paris Aero Show would be incomplete without mention of the beautiful decoration of the Grand Palais which succeeded in creating an atmosphere of warmth and good cheer which an examination of the thermometer would not have justified. M. André Granet, *commissaire général* of the Salon, was, as in previous years, the architect responsible for the decoration, both of the building as well as of the stands, which were of a uniform character. To him, as well as to M. Louis Bréguet, president of *Chambre Syndicale des Industries Aéronautiques*, which organizes the Salons, goes the fullest credit of this great show which was certainly one of the most successful held so far.

Aircraft Exports

During the month of October, the exports of aircraft and engines from the United States, according to figures issued by the Department of Commerce, Bureau of Foreign and Domestic Commerce, were as follows:

Countries	Engines for Aircraft Number	Engines for Aircraft Dollars	Seaplanes and other Aircraft Number	Seaplanes and other Aircraft Dollars	Parts, except tires Dollars
France	..	...	..	....	1,520
Sweden	..	...	..	....	87
United Kingdom	..	...	..	....	4,336
Canada	5	286	..	....	2,592
Mexico	..	...	..	....	244
Dominican Rep.	..	...	..	....	71
Argentina	..	...	2	10,167	....
Brazil	..	...	..	....	75
Peru	..	...	..	....	1,251
B. India	..	...	..	....	108
Philippine Is.	..	...	..	....	745
Australia	..	...	1	2,055	....
Belgian Congo	..	...	..	....	25
B. S. Africa	..	...	..	....	18
Total	5	286	3	12,222	11,072



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Equipped with

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Characteristics of crafts

Prepared by JOHN JAY
Technical Assistant in European Advisory

No.	Aircraft: Make	Model	Type	Purpose	Engines: Make	Model	Rated H.P.	R.P.M.	Dimensions: Overall Span Upper ft.	Overall Span Lower ft.	Overall Length ft.	Overall Height ft.	Chord Upper ft.	Chord Lower ft.	Gap ft.	Stagger in.	Weights: Total Weight lbs.	Total Weight lbs.	Fuel lbs.
1	Aero	Ab 11	Biplane	Observation	Breitfeld-Danek	Perun II	240	1400	41.9	30.6	27.4	10.2						3381	
2	Armstrong-Whitworth	Ajax	"	Two seat fighter	Armstrong-Siddeley	Jaguar IV	385	1700	39.4	29.3	26.2	10.5						3700	
3	Avia (Miles-Bondy)	B.H.11	Monoplane	Training	Walter		60	1400	33.5	-	21.9	8.3						1279	
4	" " "	B.H.26	Biplane	Two seat fighter	"	Jupiter	430	1575	33.5	33.4	28.7	9.9	5.2	5.2				3748	
5	Avieata (Schneider)	A V M 68	Monoplane	" " "	Hispano-Suiza	12 H b	520	2000	55.8	-	31.5	11.6	8.8	-	-			5291	
6	Beatherem (S.E.A.F.)	S.O.E.	"	" " "	Salmson	C M 18	500	1650	47.9	-	32.8	9.8	7.5	-	-			5202	
7	" "	T.T.	"	Transport	"	"	500	1650	55.4	-	37.7	11.5	7.2	-	-			7760	
8	Bernard (Farbois)	12.C 1	"	Pursuit	Gnôme-Rhône	Jupiter 9 Ac	420	1750	38.7	-	22.6	9.8	5.2	-	-			3284	
9	" "	18.C 1	Biplane	"	Hispano-Suiza	12 H a	500	1800	37.4	17.3	24.6	10.2						3924	
10	Besson	M B 35	Monoplane F.B.	Submarine	Salmson	A c 9	120	1800	32.3	-	22.9	8.4						1686	
11	"	M B 36	" H.B.	Transport	3 Gnôme-Rhône	Jupiter 9 Ac	3 x 380	1575	91.8	-	61.5	15.4	19	-	-			17637	
12	Blériot	C. 61	Biplane	Height Record	Lorraine (sup.)	12 H b	450	1650	38.5	35	23.6	10.5			5.7			3354	
13	"	168	"	Transport	2 Gnôme-Rhône	Jupiter 9 Ab	2 x 420	1700	75	75	49	14.7						12018	
14	Breguet	19 A 2	"	Observation	Renault	12 K d	480	1400	48.6	36	31.2	10.9	6.6	5.6	6.6			4428	
15	"	19 G.R.	"	Long Distance	Hispano-Suiza	12 H a	500	1800	49.2	36	37.8	13.1	6.6	5.6	6.6			9162	
16	"	19	" F.B.	Observation	Lorraine	12 E b	450	1650	48.6	36	37.8	13.1	6.6	5.6	6.6			8401	
17	"	26	"	Transport	Gnôme-Rhône	Jupiter 9 Ab	420	1700	54.5	36	37.8	13.1	6.6	5.6	6.6			8827	
18	C.A.M.S.	29 A R 3-5	" H.B.A.	Spotting	Lorraine	12 Eb	450	1650	47.6		37.5	13.2						6392	
19	Caudron	89	"	Training	Hispano-Suiza	8 A b	180	1800	33.6	30.3	25.4	9.5	4.8	4.8	4.6			2193	
20	"	104	"	Observation	Gnôme-Rhône	Jupiter 9 Ac	420	1750	47.7		31.2	10.7	5.2	4.8	5.7			4431	
21	"	109	Monoplane	Training	Salmson	A d 9	40	2000	37.7		20.1	7.4	3.9	-	-			1224	
22	"	161	Biplane	"	Salmson	A c 5	60	1800	29.5		21.2	7.9	3.9	3.9	4.3			1288	
23	Dassonpe	17 A 2	Biplane	Observation	Lorraine	12 E b	450	1800	47.6	24.6	30.7	11	7.9	4.6	5.2			4510	
24	Dyle et Bacalan	D B 10	Monoplane	Bomber	2 Gnôme-Rhône	Jupiter 9 Ab	2 x 420	1700	82	-	44.3	15.4	11.2	-	-			12346	
25	Farman	F.150	Biplane F.B.	Torpedo Carrier	2 " "	Jupiter 9 Ac	2 x 380	1575	86.9	86.9	48.6	17.4	10.0	10.0				12767	
26	"	F. 160	"	Bomber	2 Farman	12 W E	2 x 500	2150	87.7	87.7	48.9	17.4						15432	
27	"	F. 170	Monoplane	Transport	Farman	12 W E	500	2150	52.8	-	38.5	10.5		-	-			7313	
28	Fiat	C R 20	Biplane	Pursuit	Fiat	A. 20	400	3200	32.1		21.6	8.9						2998	
29	Fokker	C V D	"	Observation	Hispano-Suiza	12 H a	500	1800	41	28.7	31.3	10.8						4221	
30	"	F VII 3 m	Monoplane	Commercial	3 Armstrong-Siddeley	Lynx	3 x 185	1650	63.3	-	47.6	12.8		-	-			8818	
31	Hanriot	14 3	Biplane	Ambulance	Gnôme - Rhône	C	80	1250	33.6	33.6	23.8	10						1808	
32	"	35	"	Training	Hispano-Suiza	8 A b	180	1800	37.4	37.4	24.5	9	6.9	6.9				2101	
33	"	41 H	" F.B.	"	Salmson	A c 9	120	1800	33.6	33.6	27.7	10.8	5.6	5.6				2303	
34	Koolhoven	F K 38	Monoplane	Two seat fighter	Gnôme - Rhône	Jupiter 9 Ac	420	1750	33.7	-	28.5	10.8	7.2	-	-			3295	
35	Levasseur	4 B 3 b	Biplane (M)	Observation	Lorraine	12 E b	450	1800	47.9	47.9	31.8	12.9						5291	
36	"	5 C 2	"	Two seat fighter	Hispano - Suiza	12 H a	500	1800	40	36	28.7	10.2						4379	
37	"	7 T	"	Transport	Gnôme - Rhône	Jupiter 9 Ab	420	1700	47.9	46.	32.8	12.6						5962	
38	Lioré & Olivier	LeO. 21	"	"	2 Gnôme - Rhône	Jupiter 9 Ac	2 x 420	1750	74.7	74.7	50.8	14.1						12125	
39	" "	LeO H.190	" H.B.	"	Gnôme - Rhône	Jupiter 9 Ac	420	1750	52.5	52.5	41	13.4						7058	
40	Loire-Gourdou-Lesseurre	32 C 1	Monoplane	Pursuit	" "	Jupiter 6	460	2000	40	-	24.8	9.7	6.8	-	-			3033	
41	" " "	35 C 1	"	"	Renault	12 J a	450	1800	40	-	26.3	9.7	6.2	-	-			3285	
42	Morane - Saulnier	36 Ep 2	"	Training	Gnôme - Rhône	C	80	1250	34.6	-	22.8	11.6	5.9	-	-			1543	
43	" "	129 E T 2	"	"	Hispano -Suiza	8 A b	180	1800	35.1	-	23.1	8.9	5.6	-	-			2303	
44	" "	132	"	"	Salmson	A c 9	120	1800	36.1	-	22.8	8.9	5.6	-	-			2050	
45	Nieuport	3 C 2	"	Two seat fighter	Hispano - Suiza	12 H a	500	1800	49.2	-	27.7	10.2	7.6	-	-			4367	
46	"	4 C 2	"	" " "	Salmson	C M 18	500	1650	49.2	-	27.7	10.2	7.6	-	-			4559	
47	Nieuport	42 C 1	Biplane	Pursuit	Hispano - Suiza	12 H a	500	1800	39	18	24.6	9.8						3968	
48	"	48 C 1	Monoplane	"	" "	12 J b	480	2000	32.8	-	21	9.2			-			2843	
49	Potez	25 A 2	Biplane	Observation	"	12 H a	500	1800	46.6	34	29.5	11.8	8.2	4.6	6.2			4404	
50	"	25 G R	"	Long Distance	Lorraine	12 E b	450	1800	45.9	33.4	29.5	11.8	8.2	4.6	6.2			8213	
51	"	28 C R	"	" "	Farman	12 W E	500	2150	53.1	28.6	36.9	14.1	9.6	8.2				10616	
52	Schreck - F.B.A.	21 H.M.T-6	" H.B.A.	Transport	Lorraine	12 E b	450	1650	50.5	47.2	34.6	13.8	8.2	6.2	7.9			8261	
53	S.E.C.M. (Amiot)	120 B 3	"	Bomber	"	28 - S	650	1650	70.5	47.2	44.8	16.1	9.8	8.9	8.2			8780	
54	" "	150	Monoplane	Transport	3 Hispano - Suiza	12 J a	3 x 350	1800	78.4	-	59	18		-	-			15094	
55	Smolik (Aero Tovarna)	S.16	Biplane	Observation	Lorraine	12 E b	450	1650	50.2	50.2	32.5	7.3	8.2	8.2				5049	
56	" " "	S.18	"	Training	Walter		60	1400	32.8	32.8	21.9	8.7	3.3	3.3				1221	
57	Villiers	2 A.M.C.R.	" (M)	Observation	Lorraine	12 E b	480	1650	42.6	23.6	30.5	12.1	8.2	3.8	5.2			4519	
58	"	5 C.A.M.S.	"	2 seat night fighter	"	"	450	1650	39.4	29.5	28.7	10.8	8.2	3.9	5.2			4640	
59	Wibault	7 C 1	Monoplane	Pursuit	Gnôme - Rhône	Jupiter 9 Ac	420	1750	36.1	-	24.4	9.5	6.9	-	-			3183	

Abbreviations:

F.B. = Float Seaplane

H.B. = Hull Seaplane (Flying Boat)

A. = Amphibian

M. = Marine Airplane (Watertight fuselage)

sup = Supercharger

Note: In most French military airplanes the weight empty includes machine guns, sights, parachutes, fire extinguisher and engine starter but not apparatus for oxygen supply and electrical heating of clothing.

ofrcraft at Paris Show

epar HN JAY IDE
Eur l Advisory Committee for Aeronautics

...ts	Distribution of useful load			Loading		Performances									Remarks	No.
...ful load weight lbs.	Total weight lbs.	Fuel & oil lbs.	Military or Commercial load lbs.	Crew lbs.	lbs/sq.ft.	lbs/H.P.	Maximum speed at S.L. m.p.h.	Maximum speed at 16400 ft. m.p.h.	Minimum speed m.p.h.	Climb: 3280 ft. min. sec.	6560 ft. min. sec.	9840 ft. min. sec.	13120 ft. min. sec.	16400 ft. min. sec.	Service Ceiling ft.	Duration hrs.		
2108	3381	417	348	353	8.6	6.4	134			2'	5' 10"	8' 30"	12' 50"	19' 20"	24900			1
2460	3700	580	550	320	9.7	9.6	142	137 / 9840	89			11'		24'	19680	3.5		2
1003	1279	150		353	8.3	21.4	99		40	7'	15'				13120	4		3
3111	3748	485	573	353	11.1	8.8	149		56			9' 10"	13' 35"	20'	24600	2		4
4974	5291	685	838	353	12.3	10.2	149	137		2' 18"	5'	8' 24"	12' 30"	18'0"	24400		Perf. est. High comp. Hispano giving 595 HP at 2000.	5
4768	5203	644	771	353	13.8	10.4		130				9'	13' 51"	20' 12"	23452			6
6327	7760	1323	2088	176	12.4	15.4	118		68						14760	4.2	Perf.est. Fuselage only. Cabin for 7 pass.	7
2859	3284	551	132	176	14.5	7.8	155	152	56					13'	23616	2.5		8
3362	3924	591	115	176	15	7.9	162	155							29520			9
1320	1685	276	44	176	9.5	14	101		52		11'				13776	4.3	Submarine seaplane. Stows in cylinder 6.6 x 23 feet.	10
16383	17637	2934	2976	353	12.6	15.5	112									5	Perf.est.	11
3436	3354	628		198	8.4	7.5		176							40820	3.4	Height record holder (40820 ft.). Rateau supercharger.	12
12181	12018	1855	8173	353	9.4	14.3	122										Fuselage only. Cabin for 16 passengers.	13
3782	4428	642	787	353	8.2	9.2	129	124		3'33"	7'34"	12'16"	18'23"	29'50"	22800			
8817	9162	8266	198	353	16.1	18.3									20336		Fuselage only. Perf with bombing load (2292 lb) Non stop distance record holder (3395 miles)	14
4828	5401	772	1300	353	10	12	124			4' 40"	10' 35"	18' 25"	30'		18368	4.5		15
5818	6227	1058	1984	176	10.5	14.8	127				14' 24"				15098		Cabin for 6 passengers.	16
5784	6392				10.8	14.2	105		56			28'			15580			17
2361	2193	285	88	353	7.9	12.2												18
4286	4931	596	349	353	9.1	10.3		115		3' 18"	7' 37"	12' 44"	19' 44"	28' 50"	22910			19
1301	1224	115		386	5.9	30.6	76	67 / 6560		18' 22"	45' 39"							20
1498	1288	104		388	6	21.4	88								10496			21
4781	4810	635	793	353	10	10		125		3' 28"	6' 48"	11' 04"	16' 14"	24' 53"	20992			22
12407	12345				12.3	14.7	121	118 / 19120							19680		Centre section only.	23
12211	12787	1190	2442	529	7.4	16.8	100				17'	30'	46					24
12614	15432				7.2	15.4	115	110 / 9840			11'		30'		19680	5.4	Fuselage and centre section only.	25
4866	7313	816	1874	176	12.9	14.6	126	119 / 6560		5' 05"	14' 25"	27' 21"	58' 45"		14104		Cabin for 6 passengers.	26
2926	2998	465	265	176	10.8	7.6	174		65	1' 55"	3' 55"	6' 20"	9' 50"	13' 50"	27880	℄		27
3323	4221	529	441	353	13.5	8.4	158		89	2'	4' 18"	7' 12"	10' 42"	16' 20"	22960			28
8827	8818	970	2204	353	13.9	15.9	119		89	7' 12"	17' 06"	33' 12"			13120			29
1404	1808	192	236	176	5.8	32.6	69	66 / 6560	28	8' 54"	20' 59"	40' 52"			12630			30
1712	2101	271	88	353	8.8	11.6	128		65						16400			31
1573	2303	198	22	353	5.1	19.1	75		32						10496			32
3411	3396	705	353	353	13.1	8.1		161 / 9840	58			6' 20"		14'	25590	2.5	Can be transformed into biplane by adding upper wing.	33
3876	5291	684	661	529	9.8	11.7	115	109 / 9840				20'			18040		Watertight fuselage. Quick release landing gear.	34
4733	4379	630	750	352	10.2	9.7		134							24600	2	Performances estimated.	35
2535	3962	661	1698	176	9.2	14.2	112									4	Performances estimated.	36
11196	12125	1764	4078	353	10.6	14.8	119									3.1	17 passengers in two cabins.	37
5307	7055	1059	2073	176	10.2	16.8	106									4.3	6 passengers.	38
910	3033	628	106	176	11.8	6.8	155	149			3' 08"			12'	31980	2.5		39
866	3285	639	71	176	12.2	7.8		145						15'	28536			40
851	1543	176	22	353	7.9	19.3	81	78 / 6560		5'40"	15'10"	24'40"	53		15088	3		41
672	2303	275	44	353	11.8	12.8	124				9' 46"		21' 24"		20664			42
606	2050	231	22	353	9.7	17	107	104 / 6560			18' 18"		41' 20"		17584			43
1820	4367	661	816	353	12.5	8.8	152	143	45		5' 28"		12' 31"	17'29"	28208		Performances estimated.	44
1830	4559	661	816	353	13	9.1											. Fuselage only.	45
945	3985	591	186	198	11.9	7.9	165	163		2'08"	4' 01"	6' 18"	9' 13"	13' 05"	26240	2		46
569	2843	353	51	165	13.6	7		138		2' 14"	4' 21"	6' 54"	10' 39"	16' 14"		1.5		47
1707	4484	445	949	353	8.9	8.8	131	124			6' 48"	10' 23"	14' 45"	20' 21"	24272			48
2824	8213	1973	198	353	10.4	11.5	140								19024	14		49
6327	10616	3798	176	353	15.5	9.1	130								8200			50
3249	6261	933	963	353	10.9	13.9	118	104 / 13120		5' 30"	14' 30"	30'	56'		14432	3.5		51
3893	8730	1411	1653	529	8.8	13.4	137	127 / 19120					28' 20"		18040	4.2		52
7209	16094	3086	2704	419	14.9	15.8	146								15744	4.3	Perf.est. Fuselage and centre section only. 14 passengers.	53
2315	5049	1287	635	353	10	11.2	143	120	50					28'	21420	5.5		54
641	1221	88		353	7	20.3	84		42	5' 40"					11480	2.5		55
1089	4519	519	198	353	10.5	10	138	125	56					11'33" 19690	26240		Marine airplane. Quick release landing gear.	56
1832	4640	807	672	353	10.8	10.3	139	130 / 13120	57						22960	3		57
1360	3183	882	602	176	13.3	7.6	130	137	55 / 2820	2' 42"	5' 14"	9' 57"	10' 56"	15' 17"	27880			58

FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions, Bureau of Foreign and Domestic Commerce

The Spanish Aircraft Industry

Since so much of our export markets for aircraft products lie in Latin America, it is interesting to note that very strenuous efforts were made through the holding of an exhibition and other means to impress the delegates to the Ibero-American Congress on Aeronautics at Madrid, Oct. 28-29, 1926, with the growth and extent of the Spanish aircraft manufacturing industry. There is no question that the Spanish manufacturers hope to create a definite export market in the Latin-American countries. In view of this, it is interesting to note the following extracts from a very complete report on the present state of the Spanish aircraft industry by American Consul Clinton E. MacEachran at Madrid.

"National self-sufficiency for Spain's aircraft industry within a short time was predicted by the Chief of the Civil Aeronautics Service before the Ibero-American Congress on Aeronautics at Madrid on Oct. 29, 1926. According to this authority, Spanish enterprise is building up a relatively extensive industry at the present time. Due to the support of purchases by the National Government, it has already reached the point where practically all the aviation requirements of the country are produced in Spain. Planes and parts are manufactured by the following concerns:

"La Hispano"—Guadalajara:

The plant of this firm is located near Madrid along the direct railroad from the capital to Barcelona, and includes a large flying field and shops equipped with modern machinery. Nearly 7,000,000 pesetas have been invested in land, buildings and machinery.

Most of the output of "La Hispano," which is a branch of the "Hispano-Suiza" of Barcelona, is bought by the Army aviation service, the predominant type manufactured being De Havilland model planes with 300 hp. Hispano Suiza engines, manufactured in Barcelona. The Government recently bought from it twenty-five airplanes of the De Havilland type with 220 hp. engines for training purposes. [A closer identification of the particular DH design is not given but it seems probable that it is the DH-4—Ed.]

Recently, the firm has acquired the Potez patents with which it hopes to improve still further its products for army aviation.

"Construcciones Aeronauticas, S.A."—Getafe:

This society, also completely Spanish, acquired two and a half years ago more than 30,000 square meters of land between the Aerodrome of Getafe and the Madrid-Zaragoza-Alicante railroad, near Madrid, 5,000 square meters of which it has already covered and is completing the covering of another 2,000. It has spent more than 1,000,000 pesetas on its workshops which are equipped with up-to-date machinery.

Breguet airplane patents and the Lamblin radiator patent are used in its products. In 1925, the society delivered to Spanish military aviation material of one kind or another valued at over 1,000,000 pesetas. The Breguet XIX plane of hard aluminum construction is manufactured in this factory, Spain being second in the production of this type which was used in the flight to the Philippine Islands. Recently the patents of the Dornier flyingboat (type of the "Plus Ultra") have been acquired, and the company expects shortly to have completed its workshops in Cadiz for their manufacture. [This is the Dornier Wal with twin Rolls Royce engines—Ed.]

"Sociedad Espanola de Trafico Aereo" (*Loring*)—Carabanchel Alto:

The Sociedad Espanola has achieved the distinction of producing a plane which is not only entirely Spanish in manufacture but also in design. Its R.3 plane, equipped with a 500 hp. Hispano Suiza engine, has passed a number of severe tests and is generally approved as a noteworthy contribution to aviation. Four of this type will be used shortly in the flight planned to Spanish Guinea, and others put into service in the commercial Sevilla-Tetuan-Larache line.

Twenty planes of a Fokker design have been produced by this company whose shops are located in Carabanchel Alto, also near Madrid.

Production of Engines:

"Hispano-Suiza"—Barcelona:

This important factory constructs airplane engines of the Lorraine Dietrich type, a large part of its output being absorbed by Spanish plane manufacturers.

Production of Accessories:

Propellers:

Construction of propellers has reached a high degree of perfection in Spain. Four shops exist in Madrid and Getafe for their manufacture with the necessary warehouses of choice dessicated woods.

Radiators:

Besides the Lamblin radiators, mentioned above, which are used by the Construcciones Aeronauticas in Getafe, there are two more factories turning out radiators in Madrid, the chief of them producing the Coromina radiator. There are also three of these factories in Barcelona.

Magnetos:

The workshops of Sanchez Quinones, situated in this district, construct the magnetos, B.T.H., Bosch and Watford, for aviation engines. In addition, the Sociedad Jareno and the Construcciones Aeronauticas have excellent, modern machinery and laboratories for electrical measurements where magnetos are produced.

Varnishes:

A factory for producing dopes and varnishes for planes has recently been established in Getafe by Sanchez Guinones, and the Compania Resinera Espanola has been studying the question of opening another.

Argentina Start Airplane Manufacture

The cornerstone for the first airplane factory in Argentina was laid recently at the city of Cordoba, Province of Cordoba. The ceremony was celebrated by army and civil air maneuvers and signing of the contracts for the necessary construction work.

The factory is semiofficial in character, its first purpose being to assure independence of imported air equipment in time of war. The factory will, however, in normal times construct planes for civilian customers as well as for military service.

It is estimated in Argentina that the plant will be able to construct complete airplanes within three years. The Argentine Government has acquired patent rights for Loraine Dietrich engines and for two years these will be only assembled in Argentina. The first planes will be the French Breguet type.

Progress on the Pan-American Flight

On Dec. 27 the Pan-American fliers visited President Calles, of Mexico, at Mexico City, and were received in the reception room of the national palace. The interview lasted ten minutes.

Major Dargue, Captain Mac Daniels and Lieutenant Weddington, accompanied by Colonel Davis, Military Attaché of the American Embassy, and Ignacio Delatorre, representing the Mexican Foreign Office, arrived at the palace at 5 o'clock and were immediately received by President Calles.

Major Dargue presented a letter from President Coolidge, expressing thanks for the courtesies shown by the Mexican Government, and especially by the Mexican pilot, Major Pablo Sidar, who met the American fliers many miles North of Tampico and later accompanied the American plane, the San Francisco, to Vera Cruz.

President Calles congratulated the fliers and wished them great success during the flight.

With engine troubles overcome, the fliers hopped off at 10:15 a.m., Dec. 31, from Vera Cruz, and landed at Minatilan, near Puerto, Mexico. After leaving Minatilan, the fliers encountered strong winds. They passed over uninhabited country at this time, but the River Coatzacoalcos guided them until they sighted the Pacific Ocean from an altitude of 4,000 ft. Salina Cruz, which was their objective, was covered with clouds of dust, but the planes landed on the water and taxied up the beach.

The planes landed at Salina Cruz at 12:48 p.m., having made the 150 mile flight across the Isthmus of Tehuantepec in 1 hr. 15 min.

Leaving Salina Cruz at 7 a.m., Jan. 2, the fliers landed at the aviation field, Guatemala City, at 1:05 p.m.

The five Loening Amphibian planes, which are being used in the Pan-American flight, are equipped with several interesting devices for the safeguarding of the Army fliers on flights over water.

Each plane has a small still for purifying sea water. In case of a forced landing and a consequent period of exposure at sea, gasoline will serve as a fuel for the operation of the still, and fresh water will be available as long as the supply of gasoline lasts. This fresh water, together with the emergency ration, may prove of great utility in the event of any difficulty at sea. The stills were manufactured at the Army Air Corps Intermediate Deport, Rockwell Field, Cal.

In the equipment of each plane, there is also a collapsible pneumatic raft of two-man capacity. When deflated and packed, this raft is carried in a small water-proof bag about 10 x 4 in. Each plane also carries a pair of collapsible oars.

A signal kite, designed and constructed by Samuel Perkins is also included with the equipment. A long red streamer is attached to each kite and in the event that a plane is forced down on the water, it is intended that the kite be flown at once to attract the attention of vessels at a distance. When not in use, this kite, which is built on the general plan of a box kite, is folded and stowed away in a comparatively small compartment. For use to attract the attention of passing ships at night, each plane is provided with rockets and flares.

Three compasses have been placed in each of the seaplanes, a needle compass in each of the two cockpits and an earth inductor compass in the rear part of the fuselage, with distant reading instruments in each cockpit. Errors caused by the magnetic effect of the steel parts of a plane range from 30 to 40 per cent in the needle compasses, but never average more than 3 or 4 per cent in the inductor compass, due to the distance of the latter compass from the steel of the engine metal.

A complete set of signals to cover every emergency was devised by Major Dargue sometime prior to the start of the flight. There are signals for forced landings, announcement of engine trouble and requests for help. If a pilot who is forced down deems it advisable for the rest of the flight personnel to land with him, he can so indicate this. If he is to land for a few minutes only, and does not need the assistance of others, he can signal them to fly on, with the expectation of following shortly. For the convenience and ready reference of the pilots, a diagrammatic chart of these signals is posted in the cockpit of each plane.

Vought Awards Bonuses to Employees

The Chance Vought Corporation, manufacturers of the well-known Vought aircraft, has just completed another successful year's operation, and in line with the company's policy of sharing profits with its employees, the directors authorized the distribution of generous cash bonuses among the employees for Christmas.

A bonus of three per cent, based on the total amount of wages received for the year, was awarded to all employees throughout the organization who had been in continuous service for the twelve months' period.

Approximately 150 workers have been regularly employed for many years past producing aircraft, and scores of these employees have been with the Vought organization since the close of the War. Practically everybody shared in the bonus awards.

Accompanying the bonus checks to employees was a personal letter from Geo. W. Vought, the president of the corporation, who said:

"The past year has been a prosperous one in the operation of our company, and as our personnel know, we desire, in years of prosperity, to reward those of our employees who have been continuously with us in the service of the corporation. Our business has continued to maintain its capacity output and, in addition, the organization has produced, in co-operation with the Bureau of Aeronautics, a remarkable new type Naval Observation and High-speed Scouting Plane, which amply testifies to Vought leadership and technical supremacy.

"Official flight tests have recently been completed of this new model, the 'Corsair', which definitely indicate that as a two-seater plane, it possesses the performance and maneuverability characteristics of service single-seater fighters, especially at high altitudes, in addition to ability to carry greater loads with a greater speed range. Its advent marks another milestone in our aeronautical progress and in supplying our Government with military aircraft of the most modern and efficient types.

"While we have practically the same number of employees as heretofore, we, of course, have had to bring new employees into the organization from time to time. Our older employees have helped train these new people in the exercise of meticulous care in the fabrication of our product, as well as in our methods and to our standards whereby we produce aircraft of the highest possible excellence.

"We appreciate the loyalty of our personnel to the organization, and to the products which typify its well earned position in the aeronautical industry.

"It is my firm belief that the Vought organization is unique in the aeronautical industry in the number and percentage of long-time employees. This is ample indication of harmonious relations, and loyalty and mutual appreciation, that, I am sure, are not to be found elsewhere."

Wright Air-Cooled Engines Discussed

The Journal of the American Society of Naval Engineers for November carries an article on the Development of the Wright Air-cooled Aviation Engine, by Capt. H. C. Dinger, which traces the evolution of this engine from the experiments of Charles L. Lawrance in 1916 to the present time.

The article is fully illustrated and the various types of engines are described and contrasted.

New Air Mail Rate Effective Feb. 1.

The new air mail rate of ten cents a half ounce or fraction thereof, will become effective Feb. 1. This will apply regardless of the distance covered, it was recently announced by the Post Office Department.

This will supersede the present system of zoned rates for air mail. The variety of rates now effective has caused such confusion to users of the air mail, that the simplification became necessary.

The A.S.P.A. Junior Flight Competition

An event, which bids fair to put junior aeronautical activity very much in the lime light this coming season, is the Junior Trans-Continental flight competition from San Francisco to Boston, for pilots under eighteen years of age, and for which a prize of $1,000 has been offered by the American Society for Promotion of Aviation.

A survey of the proposed course has been made by Jack Laass, Travel Air representative in the West and member of the A.S.P.A. Mr. Laass takes pride in the fact that he trained Frank Reppingille of Detroit, one of the World's youngest fliers, and will if possible have him entered as Detroit's entry.

Harry Copland, of Hartford, another A.S.P.A. member, turned sixteen year old Charles Burnham loose recently on his first "solo," and it now appears that Hartford will have a representative in the Trans-Continental flight.

Hundreds of letters have been received by the American Society for Promotion of Aviation, from those anxious to enter, and it will surprise America to learn that there are probably a hundred boys under eighteen years of age that have soloed and would like to try the hop if they can secure financial backing.

It would appear that Travel Air representatives were on the job to make a showing in this event. George Weiss, according to a letter received from Nathan Quinn, sixteen years of age, passed Quinn on his F.A.I. tests last week. Quinn was one of the first entries recorded.

Jimmie Stewart, seventeen, of Newton High School, Brooklyn, has been training with Major Russell Simpson, at Roosevelt Field, L. I. and is just waiting to hear the starter's gun. Bill Murphy, Jr., of Newburgh, N. Y. has found a backer to furnish a plane, and will represent Newburgh. Norman Dilley, seventeen, of Kansas City, has written for information, stating that he has secured backing and will be ready to go in September.

Although announced that contestants would fly alone, it has been suggested that the rules be revised so that the Junior pilot be allowed to carry a passenger, a licensed pilot, on the flight. This change will no doubt be made.

Two Civil Aviation Appointments

Dr. Louis Hopewell Bauer, formerly major, Medical Corps, U. S. Air Service, was appointed Medical Director of the Aeronautics Branch, Department of Commerce on Nov. 16, 1926. Dr. Bauer joins the staff of Assistant Secretary MacCracken after thirteen years' service in the Army, of which 7½ years were in the Air Service. Dr. Bauer organized the School of Air Medicine at Mitchel Field and was commandant of that organization for 6½ years. In addition to being the author of many articles in regard to flight surgeons' duties, he is the writer of "Air Medicine", an outstanding work recently published.

On Dec. 6, 1926, R. G. Lockwood, recently civilian test pilot at McCook Field, was appointed Supervising Inspector in the Registration Division of Aeronautics Branch, Department of Commerce. Mr. Lockwood enlisted in the Royal Flying Corps in 1915, serving in that organization and with the Royal Air Force until 1919, when he joined the Service Aviation Company. In 1920 he became a test pilot at McCook Field where he served until his present appointment. During this period he added 2,486 hr., 30 min. of official flying time to his record. He has tested all types of aircraft used in the United States Army, in addition to which he was organizer of the Liaison Section and chief of the Planning Bureau of the Flying Section at McCook Field.

General Gilmore on N.A.C.A.

In accordance with the recommendation of the Secretary of War, the President has designated Brig. Gen. W. E. Gilmore, as the Air Corps representative on the National Advisory Committee for Aeronautics.

Side Slips

By ROBERT R. OSBORN

The writers and editors of pseudo-scientific magazines and books certainly find aviation a fertile field in which to develop their wild inventions and prognosticate equally wildly upon the future and what it holds. Hundreds of valuable inventions and a complete scientific prophecy and almanac of the World for some centuries to come may be obtained at all newsstands for as little as twenty cents. The writing of material of this type seems to be easy, lucrative and also safe, for, if one makes emphatic prophecies as to what will take place a century or more hence, will the writer care if some one points the finger of scorn at his grave when the predictions fail to materialize? We imagine not.

Seeing how easy this sort of reading matter is to turn out and how popular it seems to be with certain classes of the general public, we've decided to do a little prognosticating on our own hook. The prophecies which follow are made without any sort of qualification and if anyone cares to dispute them, that is his privelege. However, these are our stories and we are going to stick to them, no matter what objections are made.

• • •

Prior to the year 1990, a passenger will climb into a plane for his first ride without saying to the pilot "Now, please don't do any stunts and don't go over a hundred feet high."

• • •

In the year 1999 a newspaper will inadvertently print the true facts of an airplane accident, without exaggeration and with no imaginary horrible details.

• • •

Before the close of the present century a picture will appear in one of the Sunday newspaper picture supplements correctly captioned. If this photograph shows a lot of "Jennies" flying in formation they will not be referred to as "a string of DH's." Neither will the Los Angeles be called a "blimp."

• • •

Before the year 1982 the aviator hero of a motion picture will be protrayed as a modest unassuming chap wearing an ordinary business suit. This hero will be able to mingle with other folks without the protection of a leather coat, helmet, goggles and puttees.

• • •

Prior to the year 2556 all articles which could possibly be carried in aircraft will have been carried, and all claims to have been the first to deliver electric stoves, grand pianos, Scandinavians, etc. by airplane or airship will have been made. After this the industry can settle down to a comparatively quiet existence, being disturbed only occasionally by someone breaking the speed record for 19,688¼ meters or carrying 13,793 lb. to some height with advertising possibilities.

• • •

In the year 1930, because of an arithmetical error in the original calculations, an engine will develop the horsepower, and an airplane will have the performance, promised by the designers in their original estimates.

• • •

Some time before the year 1980 an air race will be held on the same day for which it is scheduled. By holding the race the day for which it is scheduled, the folks who have come from a distance to see it will not be forced to hunt other amusements for themselves, such as parties, which will be a splendid thing for the morals of the personnel associated with the industry. The parties will still be held, you understand, but no one will be forced to attend them because of lack of something else to do.

• • •

Some day we are going to get the copy in for this space on the day that the editor of AVIATION thinks it should be in, but we hesitate about propheeying just when that will be.

AIRPORTS AND AIRWAYS

Cincinnati, Ohio

By R. Alvin Hug

One of the most important events in this district during December was the lecture at Emery Auditorium on the twenty-eighth, given by Gen. Emberto Nobile, the pilot of the airship Norge on its flight to the North Pole. Moving pictures of the Arctic regions illustrated the lecture and proved very interesting. General Nobile was flown to Cincinnati by the Embry-Riddle Company, commercial fliers with headquarters at Lunken Airport.

Stanley Huffman, of the Embry-Riddle Company, has completed eleven hours of photographic work during the past few weeks.

Capt. John Pattison, also of Lunken Airport, has been experimenting with night flying of late and has his trim Waco equipped with wing lights and all necessary apparatus to insure safety in flying through the dark. Pattison has one of the best performing Wacos on the field, and is one of the most ardent of the Winter fliers. He can be seen zooming through the chilly atmosphere when other aviators are content to remain indoors near a hot stove.

John Paul Riddle hopped into his Waco recently and made a trip to New Orleans in the interest of the air mail. He flew by way of Nashville, Tenn., Birmingham and Mobile, Ala., and reported a pleasant trip on his return. The Emery-Riddle Company had a good year during 1926, carrying a great many people on sight-seeing trips and instructing and soloing more than a score of student fliers.

Grisard Field, under the management of Lieut. Hugh Watson and his brother, Parks, has also been the scene of much activity during the Fall and early Winter. A great deal of photographic work has been done over Cincinnati and surrounding cities, and reproductions of these photos have been appearing in the rotogravure section of the Cincinnati Sunday Enquirer. One of the most important scenes shot by Watson was the Ohio State-Michigan football game, held at Columbus. Copies of this photo were widely circulated. Watson is using but one plane during the Winter, a special 5-place job, equipped with a 180 hp. Wright "E" engine. Other planes and engines are being rebuilt and overhauled so that they will be in readiness when the Spring flying season opens.

During 1926 Grisard Field had the best season since its inception. More commercial flying has been done during the past year than in the two previous years combined. Thousands of passengers were carried, the record being 180 in one Sunday afternoon. Lieutenant Watson made a great many cross-country flights during the year, including two to Columbus, two to Cleveland, one to Indianapolis, two to Chicago and three to Louisville, Ky. He intends to add two new fast planes to his fleet, which will be used in making quick cross-country flights during the coming year.

Grisard Field will be greatly improved during the next few months and a large steel hangar, capable of housing from eight to ten planes, will be erected. Visiting pilots will be allowed to store their planes in this hangar during their stay

HOME STUDY IN AVIATION

A BABY CREEPS, BEFORE IT WALKS, and before a person attempts to fly, he or she should have a thorough knowledge of the fundamentals of aviation.

It is with this idea in view that The American Society for Promotion of Aviation has arranged its home study course.

The course has been arranged by men of actual flying experience and is based on lessons taught by the Army Air Service, and the experiences of men in the air.

The Course covers Early History of Aviation, Gliding, The Wright Brothers and Early Aviation in America, Types Past and Present, Balloons and Dirigibles, Types and Divisions of Types, Commercial Flying, Fundamentals of the Science of Flight, Relative Motion, Newton's Laws of Motion, Natural Stability, Center of Pressure and Center of Gravity.

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in the city. It is expected that Serg. P. Weese, parachute expert, who delighted the crowds during the 1926 season, will return in the Spring and continue to give Sunday exhibitions throughout next Spring and Summer.

Springfield, Ill.

By Samuel S. Hawkins

Springfield's air mail field was inaugurated last April, with the starting of the air mail service between this city and Chicago, by the Robertson Aircraft Corporation, of St. Louis, Mo. Difficulties in securing a suitable field were surmounted through the efforts of Postmaster William Conkling, the local Chamber of Commerce and Leslie Smith, Springfield's pioneer pilot. The field has been named Conkling Field, for William Conkling. It is located five miles from the postoffice, in a Northwesterly direction. In spite of the heavy rains and floods that have visited Springfield during the past year, the field has been available at all times. Originally consisting of forty acres, it has been enlarged until it now comprises seventy-five acres, with a tower beacon light fifty-three feet high. This is the first unit in a complete lighting system, which is now being installed.

Another pilot was added to the personnel last Summer, when Earl Smith joined the force. He is no relation to "Les." Earl owns an OXX6 Standard and he soloed on July 11, 1926, at Roodhouse, Ill. Les Smith gave him his start, but was unable to solo him, on account of business requiring his attention in another part of the country. Earl then went to Roodhouse, where Bill Myers is located, and finished under Bill's tutelage. Bill maintains two planes at Roodhouse, an OX5 T-M Scout and Hispano-Suiza Standard, and is a real pilot, having hundreds of hours to his credit, with no accidents of any nature, since Les Smith soloed him several years ago.

Earl Smith has developed into a very good and careful pilot and has flown about 150 hr. since he soloed. He and Samuel Hawkins recently flew to St. Louis and successfully passed the F.A.I. examination.

Passenger carrying has been good this year, considering the unfavorable weather prevalent.

Denver, Colo.

By Mr. J. McInaney

Seven 24-inch revolving electric beacons, from 3,000,000 to 7,000,000 candlepower each, will be mounted on fifty foot towers and placed at intervals on the 104-mile stretch of the air mail route from Cheyenne to Denver in January. In addition, at 3-mile intervals, blinkers will be placed, starting operation each night at sundown.

One revolving beacon light is already in operation at Lowry Field, Denver and boundary lights have been placed around the forty-acre plot.

Alexander Airport is buzzing with activity. The new hangar is being added to by two like units. A gas pump has been installed and the six Eaglerocks now being used for student instruction are doing their best to keep dry.

A. G. Murray, a new student at the Alexander Training School, soloed in four and one-half hours and assured his future flying by the immediate purchase of an Eaglerock.

A. Von Hoffman Jr., vice-president of the A.B.C. Directory Company, made the trip from St. Louis to Denver this week to take delivery of his Eaglerock. The plane will be used for close contact with the various branches of his business in as many different cities.

Manistee, Mich.

The field, which was recently purchased by the city, during 1927 will be partially developed under the direction of the City Commission. It is planned to level and mark the field and the erection of a two-plane hangar is at present under consideration.

Ultimately those in back of the project expect to have a field fully equipped to care for visiting planes, with gasoline, oil and repair facilities.

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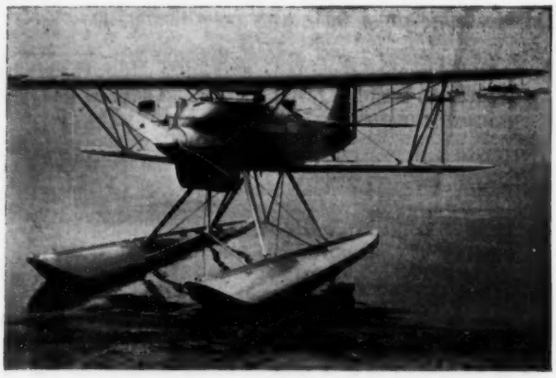
The CURTISS "HAWK" SERIES

CURTISS P-1B "HAWK". STANDARD ARMY TYPE. CURTISS D-12 MOTOR.



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IT is a universally accepted fact that the Curtiss D-12 motored "Hawk" of the Army P-1B type, is just about the finest pursuit machine in service today.

It may not be so universally known that the "Hawk" type is basically adaptable to various power-plant installations, without impairing in the least its characteristic excellence of performance and serviceability.

Above are shown four types of the "Hawk" each developed to meet a peculiar requirement of Army and Navy pursuit operations.

Each fulfills its function so satisfactorily that production orders for all types shown above are now being executed.

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Bangor, Maine

The Bangor Airport, operated by the Maine Aerial Service, Inc., is located on the Lafayette Highway, two miles West of Bangor. The field is ninety acres in area, one mile long and 800 ft. wide. It has a 800 ft. gravel runway, running Northwest and Southeast, 200 ft. East of the hangar. There is a wind cone installed on a telegraph pole 100 ft. East of the hangar.

At present all hangar space is taken, but in the Spring the company expects to build a large hangar. There is gasoline, oil and repairmen for servicing planes on the field at all times.

Ryan Airlines Meets Emergency

An avalanche, ten miles South of Jacumba, across the Mexican line, obstructed transportation recently to such an extent that the Mexicali brewery, in order to meet the demands of its patrons, secured the services of the Ryan Airlines for the delivery of beer.

Three planes flew immediately to the brewery and started work. It is estimated that it will be three months before the damage is fully repaired, during which time the three planes will carry sixty barrels of beer each day from the brewery to Tijuana, making between eight and ten trips daily.

UNITED STATES AIR FORCES

Work on Wright Field Progresses

The Department of War has just announced that improvements on Wright Field, Dayton, Ohio, which will supplant McCook Field as the Army air base, are well under way, as a result of the appropriations totaling $1,500,000.

The engineering division of the Air Corps is now located at McCook Field, but will vacate this property by July 1, 1927, so that it may be turned over to the owners from whom it was leased.

A two-story and basement reinforced concrete administration building, 56 ft. by 54 ft., and a modern one-story, saw-toothed roof steel and concrete building, 482 ft. by 301 ft., are well under construction on the property which the City of Dayton has donated to the Government for the establishment of the new field. A warehouse, a shop building, a wind tunnel, a propeller testing plant, and a generator house have been designed and construction has started.

In addition to these, it is necessary to provide railroad sidings, roads, water, a steam and electrial distribution system, storm and sanitary sewers. The grading structures will be provided during the year, or as funds become available.

Air Corps Reserve Officers' Enrollments

During the first semester of the school year, 1926-1927, there were 1,271 enrollments in the seven units of the Air Corps Reserve Officers' Training Corps at educational institutions. Of these 984 were enrolled for the basic course and 287 for the advanced course.

Proposal for Special Type Observation Airplane

Office of the Contracting Officer, McCook Field, Dayton, Ohio. Sealed proposals will be received here until 10:30 A.M. April 4, 1927 for the development of a special type observation airplane and furnishing proposed airplanes in quantities of one, two or three at Government's option for test, with option to place additional order for ten airplanes if test of smaller number so warrant. Further information on application.

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Since its organization on March 1, 1919, the Pioneer Instrument Company has devoted itself exclusively to the design, development and manufacture of aircraft instruments and equipment.

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Increased production has resulted in a reduction in the costs of Altimeters, Turn Indicators and certain other standard equipment. A new price list, showing the corresponding reduction in prices, will be mailed upon request.

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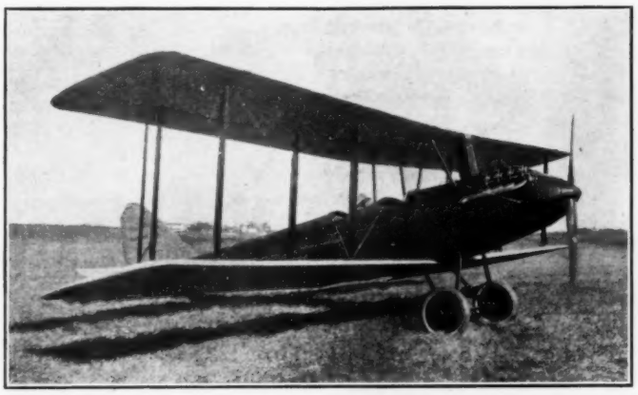

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Complete Description on Request

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Navy Gives Planes to Coast Guard

The Navy Department turned over the last of the planes allotted to the Coast Guard when the Coast Guard "5", a seaplane, was given a trial flight and put into commission at the Rockaway Point air station. This plane, a Vought UO-1 with Wright Whirlwind engine, will be used to scout along the coast and to observe the activities of Rum Row.

Similar planes have been furnished to the Coast Guard stations at Gloucester, Mass., and Cape May, N. J.

Polar Plane to be Placed in Museum

On Dec. 22 Comdr. Richard E. Byrd and Floyd Bennett flew the Josephine Ford Fokker monoplane of North Pole fame to the Ford Airport at Dearborn, Mich., where it will remain until a transportation museum, in which it will be a permanent exhibit, is built.

An escort of planes met the Arctic plane at Toledo. When it had landed, the pilots taxied it into the Ford hangar. Mrs. Bennett accompanied her husband on the trip.

Battle Fleet Activities

A detachment of nine officers and thirty-five men from U.S. Squadron One with four amphibian planes based at San Pedro for towing for the battleships' anti-aircraft practice, continue to show their merits and their performance is considered to be very satisfactory.

Anti-aircraft practices have been engaged in by VO Squadron One and UO planes were occupied in assisting with these practices. Although some difficulty was experienced owing to deficiencies in the towing gear, the amphibian planes when operating were very satisfactory.

Active work has been carried out by VO Squadron Two in individual bombing practice. This practice is something new for the observation squadrons and the pilots are practically all new to it. They have been requested and encouraged to make any suggestions as to the work in hand and both VO Squadron One and VO Squadron Two are co-operating in preparing for the practice.

The Commanding Officer reports that the straffing attack delivered by VF Squadron Two during the fleet maneuvers was timed in accordance with instructions, and was beautifully executed.

Navy Aviation Course at San Diego

Thirty-two ensigns from the Battle Fleet, Comdrs. T. N. Alford, A. D. Bernhard and a Reserve seaman from Seattle, Wash., constituting Class Four, students preliminary course in aviation, started their course at the Naval Training Station, San Diego on Dec. 6.

In a report to the department on the station activities concerning the condition of planes and material, interesting statistics are given showing the sturdiness of the NB seaplanes used for dual instruction which have just had top overhaul and are being used by the new class. The report also shows an alarming condition of equipment.

Several of the planes have had 500 hours flying and one plane has flown over one hundred hours with a large split in the propeller through which a dime could be passed. Wood in the bottom of the pontoons is rotten and on occasions the rear end of the pontoons drop off in going off the track. However, the report says, "As there are no spare propellers and no spare pontoons, and the Assembly and Repair Department is worked to the limit overhauling NB seaplanes, the old planes are being flown as long as possible."

Another interesting feature of the report concerns the catapult, which after firing 500 shots, was badly in need of major overhaul which it is now undergoing. It is expected to be ready by the first of the year when a class of pilots will start catapult instruction.

The Commander-in-Chief, Battle Fleet, Admiral R. H. Jackson, arrived on Dec. 1 by seaplane, and made an unofficial inspection of the station accompanied by the Com-

(*Continued on Page* 102)

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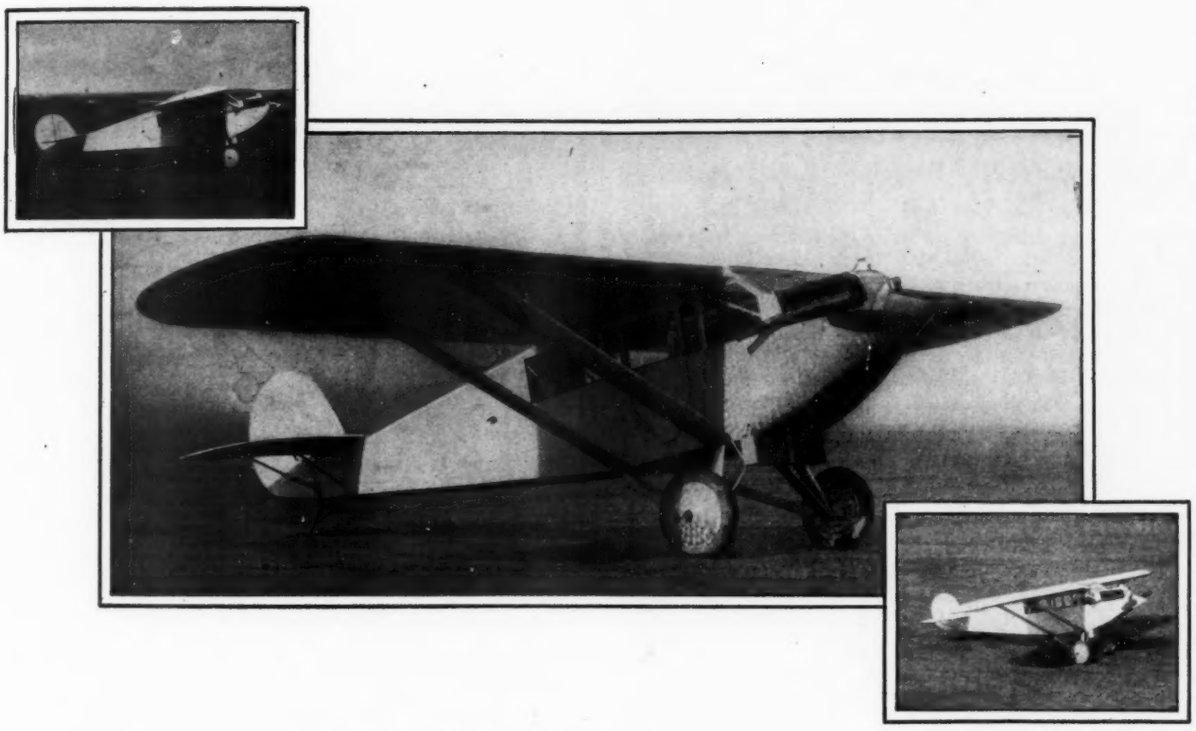

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RYAN AIRLINES

SAN DIEGO

mander, Aircraft Squadrons, and the Commanding Officer, Naval Air Station. He made an unofficial inspection of the Flight Training School on the Air Station on Saturday morning, Dec. 4.

Rear Admiral C. J. Peoples (S.C.) U.S.N., General Inspector for the Supply Corps of the West Coast, accompanied by Lieut. W. S. Hullfish (S.C.) U.S.N., visited the station on Friday, Dec. 3, and made an inspection of the Supply Department, Disbursing Office and Commissary Department.

Commander Richardson Addresses Los Angeles Engineers

On Dec. 10, Lieut. Comdr. L. B. Richardson, U.S.N., delivered an address before the members of the Society of Automotive Engineers, Los Angeles, Cal. He used as a general topic "Present Day Development in Airplanes and Airplane Engines for the Navy, together with some Discussion of the Probable Developments in the Near Future." He also showed lantern slides in connection with his talk.

Los Angeles Undergoes Repairs

The Los Angeles, has been laid up due, primarily, to lack of helium. The production at the U.S. Helium Production Plant, at Fort Worth, Texas, has been gradually declining, and as a consequence there is not an operating surplus on hand at the Naval Air Station, Lakehurst. While the ship is laid up awaiting the helium supply to be built up, overhauls will be made to the ship itself. The Navy's helium tank car which is now being used for the transportation of helium was received for the first time at the station recently. The use of this car will lessen the loss of helium enroute and will eliminate the handling of the small cylinders in which helium has been shipped heretofor.

Captain E. A. Duff, U.S.N., who recently relieved Comdr. G. B. Kranz, U.S.N., as Chaplain of this Station has been "turning to" energetically in an effort to make the station welfare activities live up to their name.

Doctor K. Arnstein, President of Goodyear Zeppelin Corp., visited the station on Dec. 17, and gave a very interesting talk to the officers of the station on recent developments in the design of rigid airships.

Army Air Orders

First Lieut. Marion L. Elliott, Air Corps, Mitchel Field, to New York City, for duty as instructor with the New York National Guard.

Sec. Lieut. Homer Ceylon Munson, Air Corps Res., Estherville, Iowa, to active duty Fort Riley, reverting to inactive status June 27.

First Lieut. Benjamin B. Cassiday. Air Corps, Air Corps Advanced Flying School, Kelly Field, to report to commandant of that school for duty.

First Lieut. Edward Henry Holterman, Air Corps Res., Woodstock, Vt., to active duty Langley Field, reverting to inactive status June 30.

First Lieut. Matt Alexander Nieminen, Air Corps Res., Aurora, Minn., to active duty Selfridge Field, reverting to inactive status June 30.

Sec. Lieut. Dan Frank Voorhees, Air Corps Res., Onarga, Ill., to active duty Langley Field, reverting to inactive status June 30.

Navy Air Orders

Lieut. Comdr. Daniel E. Barbey det. Nav. Air Sta., Pensacola, to temp. duty Rec. Bks., Puget Sound.

Lieut. (jg) Paul E. Roswall det. Nav. Air Sta., Pensacola, to VT Sqd. One, Aircraft Sqd., Setg. Flt.

Ensign Crutchfield Adair det. Nav. Air Sta., Pensacola, to VT Sqd. Two, Aircraft Sqd., Battle Flt.

Ensign Herbert R. Ballinger det. Nav. Air Sta., Pensacola, to VT Sqd. Two, Aircraft Sqd., Battle Flt.

Ensign Bromfield B. Nichol det. Nav. Air Sta., Pensacola, to VT Sqd. One, Aircraft Sqd., Setg. Flt.

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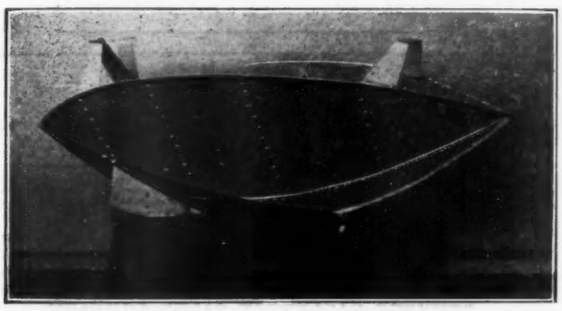

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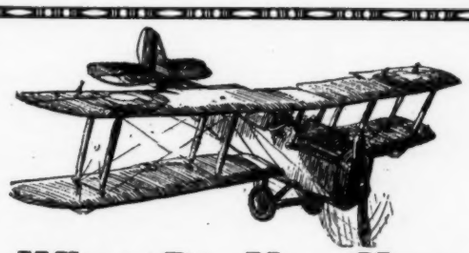

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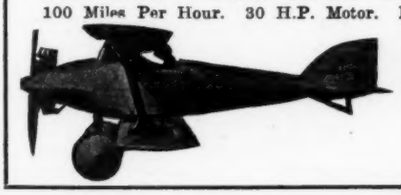

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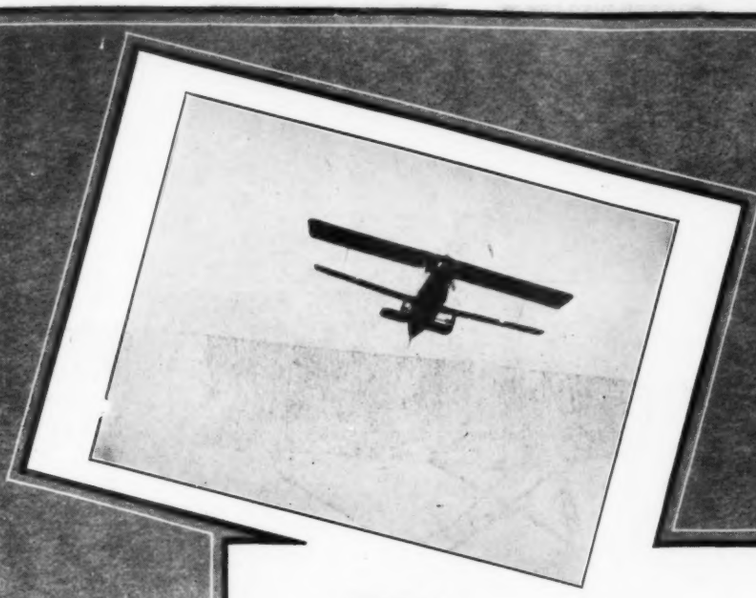

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